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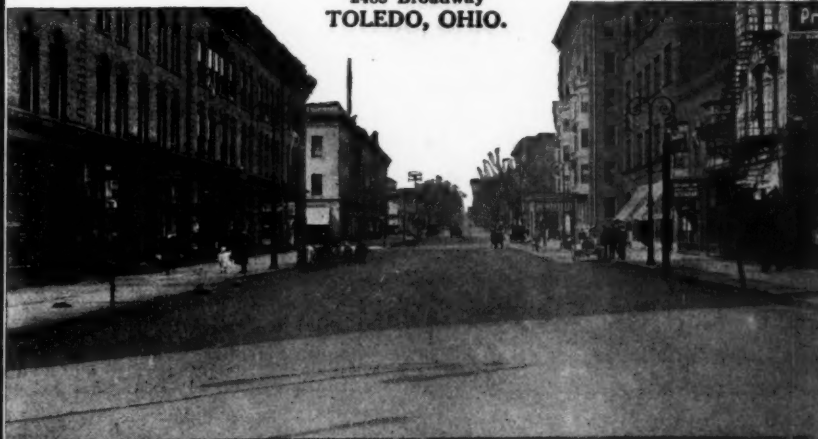
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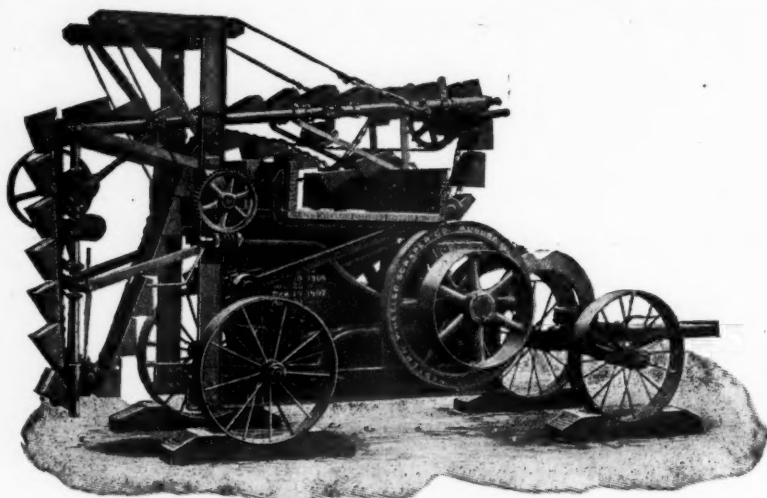
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Municipal Journal

Volume XLIV.

NEW YORK, JUNE 22, 1918

No. 25

XENIA'S SEWAGE TREATMENT PLANT

Two-Story Sedimentation Tanks and Filter Beds for Small Ohio City—Old Plant Too Small and Inefficiently Operated—Amount of Sewage About Half the Minimum Flow of Diluting Stream.

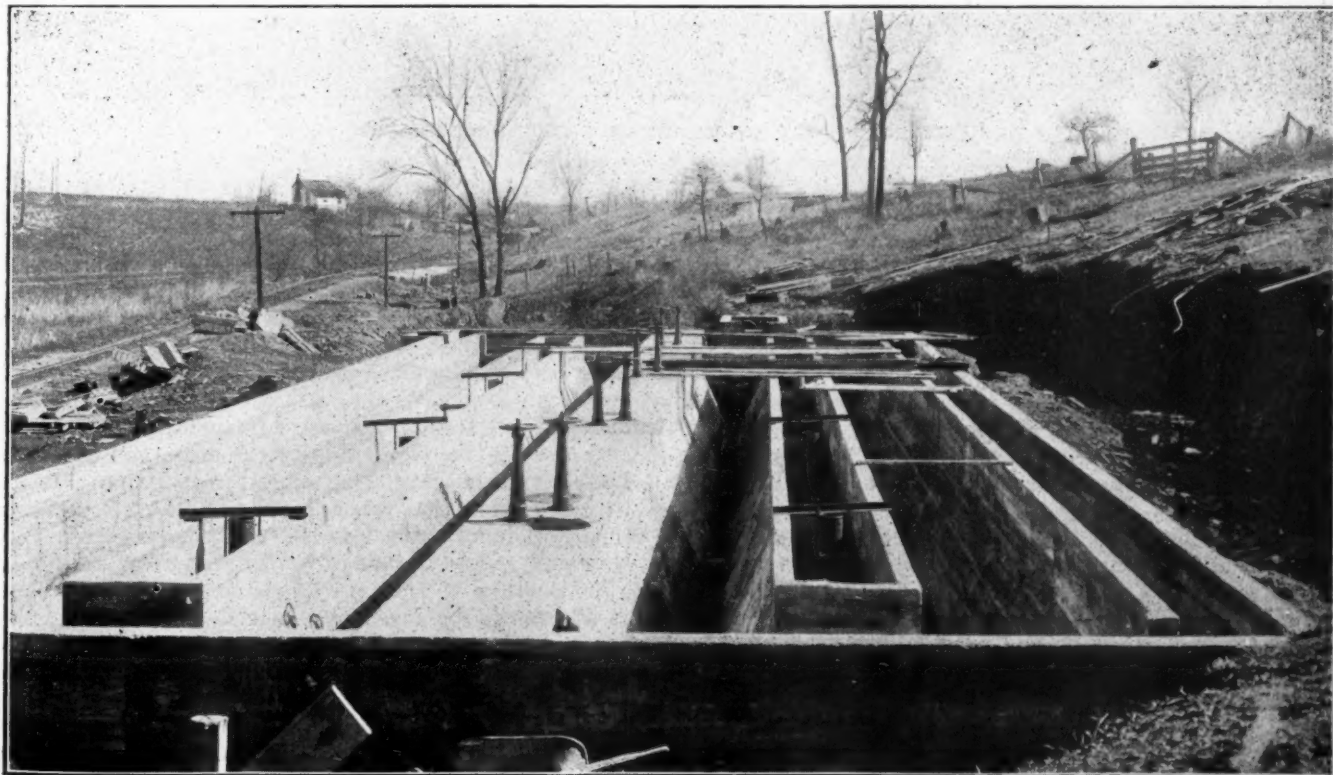
Xenia, with a population of about 9,000, is the county seat of Greene county, Ohio, a rich agricultural country with a rather sparse population—71 per square mile as compared with an average of 117 for the entire state. The business of the city is dependent largely upon the rural districts for support, although there is some manufacturing, chiefly shoes, cordage, canned goods, paper and machinery.

About fifteen years ago a fairly complete system of separate sewers was constructed, including a sewage treatment plant that consisted of two small, shallow septic tanks with a joint capacity of 19,000 gallons and about one acre of sand filters in four units. It is believed that, if well constructed, this plant could have treated 125,000 gallons per day satisfactorily, but owing to its poor construction the capacity was probably not more than 100,000 gallons per day. The total average flow of sewage, however, was probably at least 300,000 gallons a day, as at 9 A. M., December 22, 1917, there was measured a rate of flow of 350,000 gallons a day, and at 10

A. M., April 13, 1918, the flow was at the rate of 490,000 gallons, and the population has increased less than ten per cent since the plant was built. In addition to the totally inadequate size of the plant, the sand used in the filter beds was of poor quality. Moreover, the plant had never been maintained properly, but had been entirely neglected by the city authorities.

As a result of this condition the plant became a nuisance and was entirely abandoned about ten years ago, and the sewage was discharged untreated into Shawnee creek. Shawnee creek has a drainage area of about 12½ square miles, a maximum flow of about 50 second-feet and a minimum flow of about one second-foot. The pollution of the creek caused by the sewage has given trouble for several years, and a new plant has been constructed about half a mile down the creek from the old one and about 8,000 feet from Court House square, which was put into service on April 9th of this year.

The new plant consists of two Imhoff settling tanks, a sludge bed, a reinforced concrete control chamber and



TWO-STORY SETTLING TANKS OF XENIA SEWAGE TREATMENT PLANT.

four acres of sand filters. It was designed to treat a flow of domestic and manufacturing wastes aggregating 500,000 gallons in 24 hours, with provision for enlarging the capacity 50 to 100 per cent in the remote future. As the city has grown in population less than one per cent per annum for the past twenty years, there is little likelihood that its present capacity will be exceeded for many years to come.

No pumping is required, but there is sufficient fall to permit the entire plant to operate by gravity. The two-story settling tanks have a depth from flow-line to bottom of sludge chamber of 27.75 feet. The upper or settling chambers have a total capacity of 8,000 cubic feet, equivalent to a three-hour detention period when treating 500,000 gallons per day, or a two-hour period when treating 750,000 gallons per day. The lower or digestion chambers have a storage capacity of about 15,000 cubic feet. Before entering the tanks the sewage passes through bar screens formed of $\frac{3}{4}$ -in. by 1-in. bars spaced 1 in. apart. Provision is made for measuring the sewage by a weir as it enters the tanks.

Sludge beds are provided, in three units, with an area giving 0.43 square feet of bed per capita of population, on the assumption that the volume of sludge will approximate .0035 cu. ft. per capita per day.

The control or dosing chamber has a capacity of 11,000

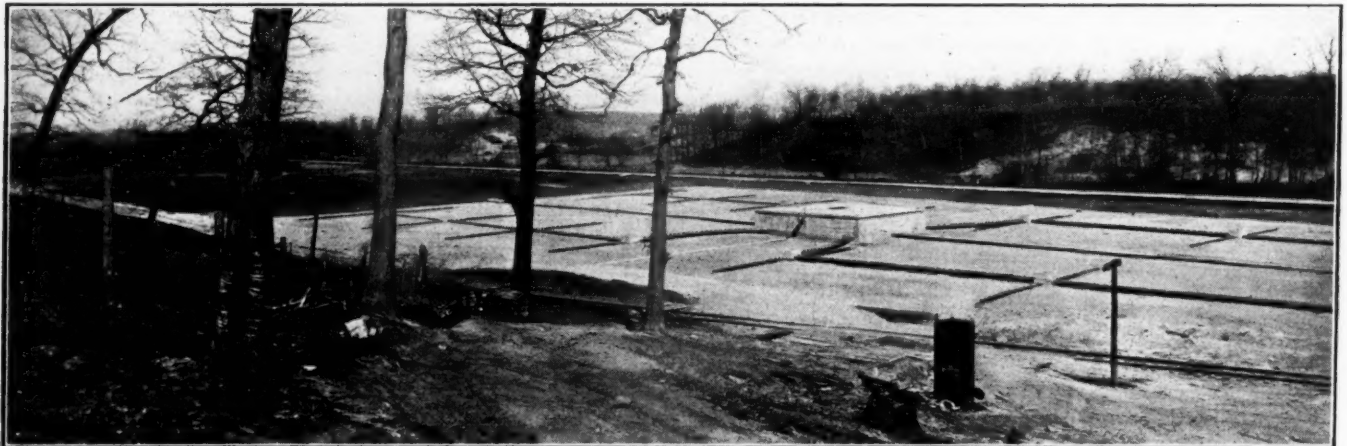
manholes, \$40 each. The cost of the outfall sewer was \$8,346; of the settling tanks, \$19,102; of the sludge bed, \$742; of the control house, \$4,883, and of the sand filters, \$24,627. Lands and right of way cost \$2,970; printing and advertising, \$262, and contingencies and engineering, \$5,028; a total cost of \$65,960.

WATER CONSUMPTION IN ST. LOUIS.

Water Commissioner Wall Urges Metering to Replace House-to-House Inspection for Reducing Waste—Saving in Coal and Money Possible.

In St. Louis, Mo., a systematic house-to-house inspection for leaks and waste of water is kept up continuously, and by this means the consumption is kept down to an average of 133 gallons per capita per day—less than at Buffalo and Chicago or even at Philadelphia. But this rate is not considered satisfactory by Edward E. Wall, water commissioner, who believes that 90 gallons would be ample allowance for domestic, commercial and public uses, and that a 20 per cent additional allowance for extravagance and waste, or 107 gallons, is attainable and reasonable.

This figure of 107 gallons is obtained by taking 40 gallons for domestic use; 12 for streets, public building



FILTER BEDS OF XENIA SEWAGE TREATMENT PLANT.

cubic feet, with a flow line $7\frac{1}{2}$ feet above the sand filter beds. It is calculated that each dose of sewage will require about thirty-five minutes for the 14-inch siphon to discharge, and that each bed will be flooded twice each day. The sand used as filtering material was specified to consist of 24 inches of sand, of which 80 per cent should pass a No. 20 sieve and be retained on a No. 40, 6 inches of gravel of $\frac{1}{8}$ inch to 1 inch diameter, and 6 inches of $\frac{3}{4}$ -inch to 2-inch stone. In making the plans, it was proposed to use galvanized iron for the carriers, but on account of the high war prices of 13 cts. per pound a change was made to vitrified pipe resting on reinforced concrete slabs.

The designing and constructing engineer was W. J. Sherman, of Toledo, Ohio, and Frank Guthrie was resident engineer. The contractor was R. T. Bailey, of Dayton, Ohio. The contract prices were 40 cts. per cubic yard for excavation of filter beds and \$1.00 per cubic yard for excavation for the tanks; filter sand and gravel, 80 cts. per cubic yard; concrete in tanks, \$15 per cubic yard; concrete in control chamber, \$8 per cubic yard; reinforcing steel, \$110 per ton; 14-inch siphons in place, \$550 each. In extending the trunk line, 20-inch sewer pipe in place cost 85 cts. per foot, and trenching cost from 30 cts. per foot for 6-ft. depth to \$7.90 for 32-ft. depth;

and parks and other public uses; 45 for commercial use, and 10 for underground losses, slip of meters, and water stolen through unrecorded connections and misrepresentations.

In May, 1912, Mr. Wall measured the consumption in 37 St. Louis residences containing 212 occupants and found an average consumption of 57 gallons per capita, with a daily minimum of 7 and maximum of 202. The next month the average was 54, minimum 6 and maximum 212. Another district containing 279 residences occupied by the poorer classes of people and containing 1,820 occupants gave an average per capita consumption of 9.82 gallons, that was reduced to 8.58 by locating and repairing leaks. In these 279 houses, however, there were only 86 baths and 109 toilets. Similar sections in other parts of the city gave $6\frac{1}{2}$ to 13 gallons per capita as averages. An investigation made some years ago of consumption in a residence of ten rooms occupied by six persons showed that on a certain day 52 gallons were used for bathing, 2.6 for drinking (eight glasses of water for each occupant), 27.4 for cooking, 16.0 for scrubbing, 29.0 in the lavatories and 51.0 in the toilets. This gave a total of 178 gallons, or a little less than 30 per capita. Mr. Wall therefore thinks an average of 40 gallons should be ample for domestic use.

The difference between 133 gallons and 107 gallons, or 26 gallons, he considers wanton waste for which there is no justification whatever. This was equivalent to twenty million gallons daily in 1917, and the cost of pumping, purifying and re-pumping this amount of water was not less than \$40 per million gallons, or \$800 a day, for operation and maintenance charges alone—\$292,000 for the year.

Much of this waste was spasmodic rather than continuous. During the 43 days of the cold spell from December 28th to February 8th last winter, the minimum consumption was 110,600,000 gallons, the maximum was 156,500,000 gallons, and the average 126,400,000; while the average during November and March was 92,000,000 gallons, indicating that 34,400,000 gallons a day was due to the low temperature—presumably letting faucets run to prevent freezing.

The coal burned per million gallons of water pumped at St. Louis (actual weights taken in the boiler rooms) averaged 3,800 pounds; therefore more than 65 tons of coal were consumed each day of the 43 in pumping this wasted water, a total of 2,800 tons, when coal deliveries were being restricted to the bare necessities of preferred classes of consumers.

If the consumption could be reduced to 107 gallons, it is estimated that the present works would supply the increasing population of the city until 1936. Among the restrictive measures that Mr. Wall would have immediately authorized may be mentioned the prohibition of lawn-sprinkling or washing sidewalks, except between certain hours in the mornings and evenings; forbidding the use of automatic devices for sprinkling lawns or gardens, except where premises are metered; prohibiting the use of water motor washing machines, and, in fact, the use of water motors in general; the enforcement of strict regulations for the conservation of the free water used by and under the orders of city departments other than the water department.

The enforcing of these regulations would require constant vigilance, and there would still remain the elimination of leaks and waste inside the house. The method of house-to-house inspection for effecting this depends for its efficiency on the frequency of individual inspections, but Mr. Wall does not believe that it can ever be completely effective. "It is not in human nature," said he recently, "for inspectors to continually perform duties more or less unpleasant,—and to perpetually make visits that are usually unwelcome, yet all the time maintain a high standard of efficiency. It does not generally require many months for an inspector to become somewhat weary of going over the same ground,—to relax his vigilance and to make his visits somewhat perfunctory. We could hardly expect to find, as a rule, for the positions of inspectors at salaries of \$75.00 per month each, men with a keen sense of humor, who would so enjoy the experience of coming in daily contact with many various and sundry specimens of humanity, that the employment would become a pleasure. People do not like to have their houses inspected. In general, they feel that in paying for a water license, they have certainly purchased a right to an extravagant use of water,—if not an absolute privilege to waste it if they desire to do so. In summer they waste many times more water in lawn-sprinkling than is necessary for the growth of the grass and flowers. In extremely cold weather they let the water run to prevent pipes from freezing. No doubt it is more economical for the consumer to waste water than to pay plumber's bills, so long as his premises are assessed at flat rates. The claim may also be set up that the loss to the community, as a whole, would

be less from the general wasting of water, than the total expense of repairing all the bursted piping that would result if the water was not allowed to run and wholesale freezing resulted. This claim might be substantiated if the matter ended with the mere comparison of the value of the water wasted and the probable plumber's bills. Unfortunately the value of the water lost is but a small part of the damage done to the public.

"The demoralizing effect of approving waste under certain conditions should be readily apparent, and its consequences could not help but be of additional assistance in forwarding the day on which the water supply would be unequal to the demand.

"The only effectual and economical method of reducing water waste and leakage to a minimum is through the general installation of meters. The results attained will be permanent and the meter will automatically act as an inspector perpetually on the job."

To thoroughly meter St. Louis would require about 100,000 meters of $\frac{3}{4}$ -inch size or smaller, in addition to those now in service. All the larger connections are already metered. It is suggested by Mr. Wall that these be installed at the rate of 20,000 a year for five years. He estimates the cost of this at present prices to average \$17.50 per meter, the 100,000 costing as follows

80,000 $\frac{5}{8}$ -inch meters at \$10 each.....	\$800,000
20,000 $\frac{3}{4}$ -inch meters at \$15 each.....	300,000
70,000 sidewalk boxes installed at \$8 each.....	560,000
30,000 installations in basements at \$3 each....	90,000

Total cost of 100,000 meters installed.....\$1,750,000

Such metering should reduce the average daily consumption to 92 million gallons in 1924, instead of the 116 million which it is estimated that it will probably be if the present policy of flat rates is continued. With metering the present water works can supply the city until 1936 and possibly until 1940 if its growth continues normal. Otherwise new works must be provided within ten years.

With an initial investment of \$1,750,000 and an annual cost after 1924 of not more than \$250,000 to cover depreciation, renewals and reading meters, the city will save annually the cost of 7,000 million gallons of water, or at least \$280,000. With the advance in costs of materials and labor, the operation and maintenance of the water works will cost more than the collections on the present basis. Either the revenue must be increased or the expenses decreased, and reducing waste seems to be the only way to decrease expenses.

"With the waste of water eliminated as far as practicable through the general installation of meters," says Mr. Wall, "there would be some hope of establishing a schedule of rates that would tend to institute just and fair dealing between the city and the consumer,—a condition which is impossible even to approach under the present system of flat, special and meter rates.

"Setting aside for the moment the immoral and unpatriotic phase of the habit of wasting water, the community must sooner or later face the consequences of the continuance of the practice. It is not too early now to start on measures for curtailing waste, and for the general installation of meters to be completed in five years. Every year that action on the matter is delayed brings the crisis nearer, and when the situation becomes so acute that further delay is impossible, remedial measures will be all the more costly."

PIGS IN THE PARKS.

The London County Council is considering the subject of keeping pigs in the parks. If the scheme fructifies,

local authorities in the provinces may find it expedient—and profitable—to turn a portion of their public parks and open spaces into municipal piggeries.—*Municipal Engineering and the Sanitary Record* (London).

RETURN LOADS BUREAUS.

The return loads bureau idea is spreading in the east and it was reported a few days ago that 32 stations had been established. These stations are as follows:

Connecticut: Chambers of Commerce of Bridgeport, Bristol, Danbury, Hartford, Meriden, New Britain, and Norwich; War Bureau of Danbury, Greenwich, Manchester, Middletown, New Haven, New London, Norwalk and Waterbury; Stamford, agency not named.

Rhode Island: Providence Chamber of Commerce.

New York: Chambers of Commerce of Buffalo and Syracuse; Merchants' Association of New York City.

New Jersey: Asbury Park, Board of Commissioners; Carney, State Council of Defense; Dover, Jersey City and Trenton, Chambers of Commerce; Garfield and Montclair, Police Station; Millville, Maurice River Transportation Co.; New Brunswick, Home Defence League; Newark, Motor Truck Club of N. J.

Pennsylvania: Philadelphia, Chamber of Commerce.

Ohio: Cleveland, Chamber of Commerce.

Michigan: Detroit, Board of Commerce.

The Highways Transport Committee of the Council of National Defense is endeavoring to secure the establishment of additional bureaus throughout the territory north of the Potomac and Ohio rivers and east of the Mississippi, where transportation conditions and freight congestion are most serious.

ELECTRIC PUMPING FOR MUNICIPAL WATER WORKS.

Deep-Well and Surface Pumps for Small Plants—Steam, Oil and Electricity Compared as Power for Such Plants.

A study of the pumping plants connected with municipal water works in the state of Iowa has been made by H. W. Wagner, mechanical and electrical engineer for the Engineering Experiment Station of Iowa State College, and a bulletin treating of electrical pumping as practiced in these plants has been published by the station. The bulletin goes quite thoroughly into the results of tests made at a number of plants, giving the complete data determined by such tests. The general discussion and conclusions are given in brief in the following abstract.

In most Iowa cities and towns, the total first cost of municipal water works averages between \$100 and \$150 per connected service. Not only does the community system afford fire protection such as is not possible with separate individual installations, but the amount named would fall short for paying for an individual well, pump and storage tank, to say nothing of power machinery or of the inconveniences of pumping by hand. Many of the communities having public supplies have populations of only 300 to 500.

In order to make the operation of such plants practicable, it is necessary that both pumps and power machines employed be reliable and economical. Direct-acting steam pumps are very reliable but are economical only in large sizes. Addition of crank and fly-wheel or separation of pump and engine tends to reduce the steam consumption for pumps of moderate size. In many small plants gasoline power has taken the field away from steam power. A gasoline engine eliminates the boiler plant,

the liquid fuel is convenient to store and handle, the engine can be started in a minute, and prohibitive operating costs are overcome. Engines burning kerosene and heavier, less costly oils, have proved even more economical in fuel cost than gasoline engines, except possibly in very small sizes.

The present tendency, however, indicates that the electrical motor is replacing all types of pumping engines. An electric pump is suitable not only for the small unit but also for replacing the large and economical steam pump. A steady, reliable electric current, always at hand, affords the maximum of convenience and the minimum of attendance and care. Where power is to be distributed to several widely separated wells, electricity is incomparably superior to steam. The over-all economy of electric pumping in comparison with engine pumping is still a matter of opinion, but engineers seem to favor electricity for municipal pumping when reliable current can be obtained at a reasonable rate.

Practically all power pumps designed to be driven by belt, gear, chain or direct connection are adaptable to operation by electric motors. The pumps commonly used in municipal plants may be classed as deep-well pumps and surface pumps. The largest flows from deep wells of moderate bore are obtained by the air-lift and propeller pumps. For a given capacity, the centrifugal pumps require the largest well bore.

DEEP-WELL PUMPS.

When the water stands at a great distance below the surface the air-lift is most reliable. Reciprocating and centrifugal pumps are made for higher heads than is the propeller pump; but very long shafts on any of these three types are liable to be a source of trouble. The air-lift is best adapted to a well shaft that may be crooked or out of plumb. It is also less injuriously affected by water containing gritty materials and injurious chemical compounds. Sand wears the valves and cylinder of a reciprocating pump. Centrifugal and propeller pumps do not have these parts, but impure water may cause rapid wear of the vanes in a centrifugal pump.

For a capacity of about 200 gallons per minute raised against a head of 100 feet, the first cost of a centrifugal pump is higher than for any other of the three types of deep-well pumps, and that of the air-lift (including compressor) is the least.

The higher the pump efficiency, the smaller the motor that can be used and the less the power cost. In ordinary operation, the above four types of pumps can generally be arranged in the following order as to efficiency; reciprocating, centrifugal, propeller, air-lift. Cost of attendance and repairs depends upon pump capacity and the type of pump chosen for a certain set of conditions. Reliability and length of useful life also depend upon type of pump and its fitness for existing conditions.

SURFACE PUMPS.

Of surface pumps, the electrically driven types now commonly employed are the vertical cylinder, single acting plunger, triplex pump, and the horizontal shaft centrifugal. Double acting piston and rotary pumps are sometimes used. The single stage centrifugal pump is generally suitable for low heads and large capacities as compared with the triplex plunger and piston pumps and with the rotary pump. Triplex pumps are higher in first cost than the surface centrifugal pumps. The first cost of rotary pumps has a wide range depending upon the quality and make, but is lower than that of triplex pumps. For moderate and high heads the power cost is lower and the efficiency higher for triplex and rotary pumps than for single-stage centrifugal pumps. A triplex or rotary pump operated at a constant speed with a range of head

maintains capacity and efficiency much better than does a centrifugal pump.

As to reliability, the centrifugal pump has fewer parts to get out of order than has the triplex, but the higher speed of the former demands careful alignment of shaft and attention to bearings. The triplex pump is generally considered more reliable than the rotary.

For fire service, the electrically driven underwriters' multiple-stage centrifugal pump is comparatively simple and reliable.

A summary of makers' prices and rated efficiencies of both deep-well and surface pumps is given in the accompanying table:

RANGES OF PRICES AND RATED EFFICIENCIES OF DIFFERENT TYPES OF PUMPS.

(Prices quoted in 1916)

DEEP WELL PUMPS.

Specified capacity, gallons per minute	100	200	400	500
Specified head	100 ft.	100 ft.	100 ft.	100 ft.
1. Reciprocating:				
Rated efficiency	82.3%	70, 82%	..	..
Price, dollars	600	1060, 1100	..	..
2. Centrifugal:				
Rated efficiency	..	48%	..	55-67%
Price, dollars	..	1350	..	1496-1687
3. Propeller:				
Rated efficiency	..	25-30%	30-35%	..
Price, dollars	..	1200	1600	..
4. Air-lift:				
Rated efficiency	..	30%	..	30%
Price, dollars	..	745	..	1170

SURFACE PUMPS.

Specified capacity, gallons per minute	200	500
Specified head	50 ft. 100 ft. 200 ft. 50 ft. 100 ft. 200 ft.	50 ft. 100 ft. 200 ft.
5. Plunger (triplex):		
Rated efficiency	67-75% 77, 78%	.. 82, 83%
Price, dollars	177 100, 177 450, 420	315 115, 315 425, 640
6. Piston (triplex):		
Rated efficiency	70%	..
Price, dollars	750	..
7. Centrifugal:		
Rated efficiency	56% 55, 58% 62, 64% 68%	64, 67% 56, 69%
Price, dollars	177 100, 177 450, 420	315 115, 315 425, 640
Rated capacity	90 300 450	100-175
Specified head	100 ft. 100 ft. 100 ft.	100 ft.
8. Rotary:		
Rated efficiency	65% 65% 65%	50%
Price, dollars	55 115 140	250

OBSERVATIONS FROM PRACTICE.

Electricity seems to be gradually replacing the forms of power for pumping where reliable current is available. Some municipalities hesitate to change from steam, however, because they consider that a steam plant under local control is more reliable for fire protection than current received over a transmission line. With reliable current, however, electric pumping gives general satisfaction because of the low cost of machinery and the convenience and low cost of attendance. But if the current is undependable or the voltage unsteady, electric pumping is unsatisfactory.

In small towns the deep-well reciprocating pump is most commonly found, and, when the lift to the surface is moderate, the same pump delivers the water into an elevated tank or pneumatic pressure tank.

Air-lifts are employed for very high lifts and under other conditions not suitable to other types of pumps. In practically all cases, when used, the air-lift pumps only to a surface reservoir.

Pumps are seldom installed in deep wells of more than 20 inches in diameter. Additional wells are drilled when more capacity is required. Various types of pumps are installed in these wells. A number of deep-well pumps may feed into a common surface reservoir from which the second-stage work is done by high pressure pumps.

Centrifugal pumps are often used for pumping from streams and lakes against low and moderate heads.

Second-stage electric pumping is generally done by single-acting triplex pumps. The cylinder sizes of most triplex waterworks pumps in service in Iowa are within the ranges of 4 x 6 and 12 x 12.

In many cases arrangements are made for off-peak

pumping; that is, the electric pumps are operated during the daytime or late in the night when the electric lighting load is low. The central station is better able to carry the pumping load at such periods and a more favorable pumping rate often results. In the case of a small storage battery central station, however, it is not likely to prove profitable to operate the engine and generator for pumping only.

To be continued.

WATER WORKS OPERATION—LEAKAGE AND WASTE.

When and Why it is Necessary to Reduce Leakage and Waste to a Minimum—Methods Available for Detecting and Locating Them.

A very large percentage of the water that enters the distribution systems throughout the country performs no useful service whatever. Some of it escapes from the mains and appurtenances and service connections underground, another part escapes through faulty plumbing in the connected buildings, while a part of that which is withdrawn for a real purpose, such as preventing pipes from freezing in winter or obtaining cold water for drinking in summer, may be considered an unjustifiable use of the water, in that in the long run the purpose served is not commensurate in value with the loss to the city as a whole in waste of water, reduction of pressure, and diminution of the supply available for fire fighting or other emergencies.

NEED FOR ELIMINATING WASTE.

Where the quantity of the supply at the source is limited, there can be no question in the minds of even the consumers themselves that all such leakage and waste should be reduced to a minimum. Where the supply is abundant, however, even water works superintendents themselves sometimes fail to realize the importance of eliminating this useless consumption and leakage, especially in cases of gravity supplies abundant in quantity, where there is no expenditure for either pumping or purifying the water. In many such plants the water departments even encourage the liberal use of water and considers it a virtue to do so. To such we suggest the following considerations, briefly stated:

The sizes of the mains leading from the reservoir to the city and of the distribution pipes are presumably calculated on the basis of a certain per capita consumption. If the unit consumption used in the calculation was larger than called for by reasonable demands, then the pipes provided were larger than necessary, and the city is making an unnecessarily large annual disbursement for interest and sinking fund on such cost. If the mains were not designed for such large consumption, leakage and waste (to an extent that may even be enormous in the case of a small city) is possible when domestic consumption only is being withdrawn from them, because of the capacity provision made for fire consumption. If, however, the emergency demands of a fire should be made upon the mains, this added to the enormous waste of water (which would unquestionably continue during the fire) would find the mains taxed beyond their capacity, as a result of which either quantity or pressure, and probably both, would be lacking. It may be the case that the capacity of the system, designed for possibly thirty years in advance, is so much greater than that demanded at present that double the estimated per capita consumption can be carried by it without danger; but in permitting the consumers to thus waste the water or in overlooking leakage or other losses directly from the system itself, those in charge of the water works are permitting a habit of

CLEANING MAINS, LEAKAGE AND METERS (Concluded).

City and state	Do mains need cleaning at intervals?	Method of cleaning	Methods of detecting and pre- venting leakage and waste	Is leakage enough to make radi- cal action desirable?	Percentage of services metered	Owner of meters*
South Carolina:						
Beaufort .....	....	Flushing	Inspection	No	None	.....
Bennettsville	No	.....	Meters	No	99	Consumer
Camden	Yes	Flushing	Inspection	No	50	City
Darlington	No	.....	Meters	No	100	Company
Florence	Yes	Flushing	Sonoscope and aquaphone	No	80	City
South Dakota:						
Aberdeen	No	.....	Meters	No	80	City
Mitchell	Yes	Not cleaned	.....	....	100	City
Rapid City	No	Flushing	Test by districts	No	80	City
Watertown	No	Flushing	Meters	No	100	Consumer
Tennessee:						
Clarksville	No	Flushing	Meters	No	40	City
Cleveland	No	.....	None	No	75	Consumer
Columbia	No	.....	Inspection	Think not	25	Company
Greenville	No	.....	.....	No	10	City
Memphis	Yes	Flushing	Pitometer and inspection	No	75	City
Murfreesboro	No	Flushing	Aquaphone	No	65	Company
Texas:						
Arlene	Probably	Never cleaned	Surface inspection	Possibly	94	Both
Austin	No	.....	Meters	No	100	Both
Brownsville	No	.....	Meters	Possibly	100	City
Cleburne	No	.....	Meters	No	67	Both
Galveston	No	.....	Surface inspection	....	100	Consumer
Hillsboro	No	.....	None	No	75	Consumer
Longview	No	.....	District meters	No	99	Consumer
McKinney	No	.....	Meters	....	100	City
Plainview	No	.....	.....	No	98	City
Vernon	Yes	Not cleaned	None	No	60	Both
Waxahachie	No	.....	None	Yes	100	Both
Weatherford	No	.....	None	Think not	90	Company
Utah:						
Salt Lake	Yes	By contract	None	Think so	23	City
Vermont:						
Barre	Yes	Flushing	Inspection	No	33	City
Bennington	No	.....	Listening	No	Small	Consumer
Essex Junction	Yes	Flushing	Inspection	No	75	City
Northfield	No	Flushing	Meters	No	70	City
Richfield	No	.....	Watchfulness	No	None	.....
Rutland	No	.....	Aquaphone	No	10	City
Virginia:						
Charlottesville	No	Not cleaned	Meters and aquaphone	Think not	65	City
Washington:						
Auburn .....	....	Flushing	.....	....	6.5	City
Centralia	Yes	Flushing	Sounding	No	3	Both
Ellensburg	No	.....	Sonoscope	No	15	City
Olympia	Yes	Flushing	Meters	No	80	City
Palouse	No	.....	Patrol	No	100	City
Port Townsend	No	.....	.....	No	4	City
Pullman	Yes	Flushing	Meters and detectophone	No	100	Consumer
Seattle	Seldom	Flush	Repair leaks	No	98	City
Spokane	No	.....	Pitometer survey and inspection	Yes	100	Consumer
Winlock	No	.....	.....	No	40	Company
West Virginia:						
Fairmont	Yes	Flushing	Meters	No	25	Both
Princeton .....	....	Flushing	.....	No	90	Company
Wisconsin:						
Antigo	No	.....	Detector	No	None	.....
Baraboo	No	.....	None	No	75	City
Beaver Dam	Yes	Flushing	.....	No	85	City
Columbus	No	.....	Detector	No	100	City
Fond du Lac	No	.....	House inspection	No	70	City
Green Bay	No	.....	.....	No	100	Company
Janesville	No	.....	Inspection	No	45	Consumer
Menomonee	No	.....	None	No	40	Consumer
Milwaukee	No	.....	Meters and patrol	No	99	Consumer
Oshkosh	Yes	Flushing	.....	....	40	Consumer
Shawano	No	.....	Detectophone	No	98	City
Sparta	Yes	Flushing	None	No	100	Both
Whitewater	Yes	Flushing	Meters	No	75	City
Wyoming:						
Rock Springs	Yes	Flushing	Watchfulness	No	100	Company
Canada:						
Toronto, Ont.	Yes	Flushing	None	r	4	City
Winnipeg, Man. ..	No	.....	Night inspection & aquephone	No	100	City

* The word "city" is used to designate municipalities of any nature or water districts; q—water waste survey contemplated; r—pitometer survey for years 1910 to 1917 showed considerable leakage.

wastefulness and carelessness to become fixed in the community, both among the consumers and among their own employees, which it will be exceedingly difficult to remedy when the demand for saving shall arise with the growth of the city.

Where the water is pumped or purified or both, there can be no question that every gallon uselessly put into and forced through the mains costs a sum that is a direct loss. It is sometimes figured that this loss is confined to the cost of the additional fuel consumed in pumping these additional gallons, and that this cost is less than that required to prevent the waste. This by no means fully covers the case, however. Many a city which has permitted waste to continue finally finds itself threatened with a

water famine unless it shall spend thousands or in some cases millions in providing an additional supply, additional pumping plant, additional filters, etc. Then it hurriedly endeavors to reduce the consumption, only to find that the habit of waste has become so established with the people that, through fear of unpopularity or through pressure brought to bear by taxpayers and voters, they find it easier to spend these large amounts on extensions rather than to take the steps necessary to limit the waste. The cost of such waste then becomes not only that of the fuel consumed, but the interest and sinking fund on all of the new constructions required to meet the unnecessary demands, together with the maintenance costs of pumping plants, filters and other structures, the cost of en-

METERS, RATES, MUNICIPAL USE (Concluded)

City and state	Is deposit on meter required?	Is rental charged for meters?†	Does city obtain water without payment?	Use made of free water	Percentage	Used for Municipal Purposes is any of it metered?
South Carolina:						
Bennettsville .....	.....	Some cases	Yes	Sprinkling, sewers, fire	20	Part
Camden	No	No	Yes	Sprinkling, sewers, fountains	15	No
Darlington	Yes	No	Yes	City buildings	.....	All
Florence	No	\$1.20	Yes	All public uses	33	Pub. buildings
South Dakota:						
Aberdeen	No	No	Yes	Hospital and schools	.....	No
Mitchell	No	Minimum charge	Yes	.....	.....	Schools
Rapid City	No	No	Yes	All municipal uses	20	Schools
Watertown .....	.....	.....	Yes	Flushing sewers	.....	All
Tennessee:						
Clarksville	Non-owners	Minimum charge	Yes	All but schools	15	Fountains
Cleveland .....	.....	No	Yes	Sewers, public buildings, fire	.....	No
Columbia	Seldom	No	Yes	City Hall, engine house, water troughs	6 to 10	All but sewers
Greenville	No	Yes	Yes	Streets, sewers, schools	5	No
Memphis	Yes	No	Yes	Flushing streets and sewers, parks, fires	10	Buildings
Murfreesboro .....	.....	\$3	Yes	Flushing sewers	10	Yes
Texas:						
Abilene	Non-owners	\$3	Yes	Public buildings and water troughs	5	Yes
Austin	Yes	\$3	Yes	Schools, parks, fire	.....	All but flushing
Brownsville	Yes	No	Yes	Street sprinkling, sewer flushing, fire	.....	33%
Cleburne .....	.....	\$3	Yes	All city purposes	12	No
Galveston .....	.....	\$3 ^u	.....	.....	.....	Schools
Hillsboro	\$2.65	.....	.....	.....	.....	Schools
Longview .....	.....	.....	Yes	Parks and fire	3	No
McKinney	\$1	\$3	No	.....	5	Yes
Plainview	No	No	.....	.....	5	No
Vernon .....	.....	No	.....	.....	.....	.....
Waxahachie	Yes	No	Yes	All city purposes	15	All
Weatherford	No	No	Yes	Schools, City Hall, fountain	.....	No
Utah:						
Salt Lake	Non-owners	No ^v	Yes	Public b'd'gs, parks, etc.	17	No
Vermont:						
Barre	No	No	No	.....	.....	No
Bennington	No	Yes	Yes	Water troughs	Small	No
Essex Junction	No	No	Yes	Flushing sewers	.....	Schools
Northfield .....	.....	Yes	Yes	Flushing sewers	.....	No
Richfield .....	.....	.....	Yes	Fire	.....	Schools
Rutland	No	No	Yes	City buildings, etc.	.....	No
Virginia:						
Charlottesville .....	.....	No	Yes	.....	15	Yes
Washington:						
Auburn	No	No	Yes	Public works, etc.	4	No
Centralia	No	No	Yes	Fountains, flushing streets	0.1	Schools
Ellensburg	No	No	.....	.....	1	All
Olympia	No	No	No	.....	.....	Schools
Palouse .....	.....	.....	Yes	Flushing streets, fire	10	Schools
Port Townsend	No	Yes	No	.....	.....	All
Pullman	Yes	.....	.....	.....	1 to 3	Schools
Seattle .....	.....	No	No	.....	12	Schools only
Spokane .....	.....	No	No	.....	w	Public bldgs
Winlock	No	No	Yes	Street sprinkling, 2 public fountains	5	No
West Virginia:						
Fairmont	No	Yes	Yes	Street flushing and fire	10	Schools
Princeton	No	No	Yes	Fire station	.....	Buildings
Wisconsin:						
Baraboo .....	.....	\$3	No	.....	.....	Schools
Beaver Dam	No	\$1	Yes	Flushing sewers	.....	No
Columbus	No	.....	Yes	Fountains	7	Yes
Fond du Lac .....	.....	Service charge	Yes	Drinking fountains	.....	Schools
Green Bay	No ^v	Service charge	No	.....	.....	All
Janesville .....	.....	.....	No	.....	.....	Schools
Menomonee .....	.....	.....	No	.....	.....	Schools, city bldgs
Milwaukee	No	.....	No	.....	.....	.....
Oshkosh	Yes	.....	No	.....	.....	Yes
Shawano	No	Minimum charge	No	.....	8	Schools
Snarta .....	.....	Yes	Yes	Flushing sewers	1	All but flushing
Whitewater .....	.....	No	No	.....	.....	All
Wyoming:						
Rock Springs	No	No	No	.....	1%	All
Canada:						
Toronto, Ont.	No	No	No	.....	.....	Some
Winnipeg, Man.	No	No	No	.....	.....	.....

†Amounts given are annual rentals, in some cases reported as quarterly or monthly payments; u—city furnishes meter, consumer pays for same \$3 a year for 5 years; v—collect in advance; w—will be 100% metered by July 1; y—installation charge of \$2 to \$8.

gineers and firemen and other attendants, and frequently increased overhead charges of other kinds. As an illustration, the city of Buffalo has during the past year or two been carrying on leakage and waste investigations by means of the pitometer and house-to-house inspection combined and, although only a part of the city has been covered, it has already been possible to close down one of the pumping stations during the greater part of the time and, with only a little more decrease in waste, it will be possible to abandon it altogether, thus saving the cost of the pumping station force and the upkeep of the plant as well as of the fuel. Had precautions been taken some

years ago to prevent the waste which it is now eliminating, the entire cost of establishing this station could have been avoided.

There are any quantity of instances on record where there is no question about the economy of conducting a leakage and waste survey. One of the instances noted in Municipal Journal is that of Lancaster, Pennsylvania, where the leaks in the street mains that were discovered and stopped by a survey conducted during one season amounted to one and a quarter million gallons per day, the elimination of which saved the city about \$17,000 a year based on pumping costs only, while the total cost of

the survey was less than \$3,000. The city of Washington for a number of years kept parties continuously in the field making such surveys, and records of the leaks discovered and stopped indicated almost every year that the cost during that year of making the survey was more than met by one year's pumping cost of the amount of leakage discovered and stopped during that year, without taking into account that the saving made during any one year would be repeated annually for an indefinite period.

METHODS OF DETECTING WASTE.

There are a number of ways of investigating leakage and waste. One is to look for the leaks themselves in the distribution system, inspect plumbing fixtures for leaks and endeavor to discover by detective work instances of waste by consumers. Another is to measure the amount of water going into the system and, comparing this with the number of consumers, judge whether the amount of per capita consumption (using the word consumption to cover all water that enters the distribution system) is excessive. In making such estimate, the possibility of large amounts being legitimately used for manufacturing or other commercial purposes should not be overlooked. For instance, in the case of Buffalo the per capita consumption was calculated to be more than 300 gallons per capita, and it might seem that at least two-thirds of this was waste. Investigation revealed, however, that about 110 gallons per capita was being used through meters for commercial purposes and, being paid for by meter, was probably being used legitimately.

This plan of estimating per capita consumption is, of course, only a first step to determine whether there probably is sufficient leakage and waste to warrant further investigation. The same general principles are frequently employed in the investigation itself, the city being divided into small districts and the population, commercial uses, and total consumption in these districts determined, or the consumption determined during the night when it should be practically nothing. For locating individual leaking fixtures or instances of waste, the same idea of determining night consumption is applied to individual consumers, generally by some form of apparatus for conveying and magnifying the sound caused by water flowing through the service.

A comprehensive survey will generally employ all of these methods, first determining in a general way the extent of the leakage or waste for the entire city, then determining the amount in each of several districts and, where the amount of district waste so determined seems to warrant it, locating the exact pipe joint, appurtenance, service, or building at which such loss of water occurs.

The loss being located, the matter of stopping it is simple if it be a leak, consisting merely of replacing a broken pipe, remaking a defective joint, repairing or putting into condition a leaking valve or hydrant, or requiring a consumer to replace defective plumbing.

Stopping of waste, however, is a much more difficult matter, since waste stopped today may begin again tomorrow and continue unabated until rediscovered by a future investigation. A common, and until within recent years the most common, method of endeavoring to prevent waste was house-to-house inspection. This seldom has proved more than partially successful, however, for the reason just stated—that such inspection stops the waste only temporarily, while the cost of it prevents the visiting of all premises at short intervals, and also because it is difficult to secure a sufficient number of inspectors who will faithfully perform a service that brings them the dislike of the majority of the consumers, some of whom may have influence politically or otherwise that can be used to the disadvantage of the inspector. It is now, we

believe, almost universally considered that the only method of successfully minimizing waste is to have an inspector continuously on the job, and one that cannot be influenced by personal motives or political pressure, and the only inspector of this kind that has been discovered that can be furnished at practicable cost is a water meter.

A RESERVOIR PARK IN ALBANY.

Years ago the city of Albany, N. Y., located a reservoir on a piece of property known as the Tivoli lakes property, on which are two lakes in addition to the reservoir, which reservoir was constructed as a part of the gravity water supply system. Recently there has been a sentiment in favor of making this property over into a park, with particular provision for recreational facilities.

During the summer of 1916, the Bureau of Engineering made a topographical survey and map of the property and referred the matter of the development of this tract into a park to Charles Downing Lay, consulting landscape architect to the city. After a series of conferences, Mr. Lay, in October, submitted a report that was very satisfactory. The topography of this tract readily lends itself to park purposes, and the various features recommended and planned will give facilities not alone for recreation but also for rest and quiet.

Briefly summarized, the plan provides for changing the location of a boulevard that runs through the property; constructing ten tennis courts in one part of the property, eleven in another, two full-sized regulation baseball diamonds, three parking spaces for automobiles, with ample room for a total of one hundred and thirty cars, and a playground with playground apparatus for small children. A space will be set apart in the smaller lake for seven hockey rinks, the larger lake reserved for swimming and boating in the summer and plain skating in the winter, and one of the arms of the larger lake reserved as a wading pool for small children in the summer and for figure skating of adults in the winter. The other of the two arms of the larger lake will be reserved for the sailing of toy boats and wading in summer and for the skating of children in winter. On one of the highest and longest hills it is proposed to have a slide for coasting which will take coasters out over the ice of the larger lake for some distance. The location of a casino and bath house is indicated on the plan and provision could be made on the roof for a band stand for municipal concerts. Besides the features outlined, there are roads and paths to be built and changed, planting of trees and shrubs to be done, underbrush to be cleared out and seeding of open areas for grass.

Anticipating the future development of this property, the Common Council has passed two ordinances which will do much toward making it a park. One ordinance authorizes the construction of a trunk sewer to connect up the sewers from Arbor Hill which now discharge into the lakes, thus removing the pollution now discharging into the lakes and preparing the way for the use of the larger lake for swimming, boating and wading in the future. The construction of this sewer has not yet been undertaken because of the high prices prevailing last summer and the need of devoting all the resources of the Bureau of Engineering to the completion of some larger and necessary public improvements during last summer and fall. The other ordinance provided for the extension, grading and paving of a street to give access to the park. The grading work of this latter improvement was placed under contract and should be completed this summer.

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Contributed Articles and Reports.

Contributions suitable for this paper, either in the form of special articles or as letters discussing municipal matters, are invited and paid for.

City officials and civic organizations are particularly requested to send to Municipal Journal regularly their annual and special reports.

Information Bureau.

Municipal Journal's Information Bureau, developed by twenty-one years' research and practical experience in its special field, is at the command of our subscribers at all times and without charge.

THE CITIES' PEACE PROBLEM.

That we are not naturally a war-like nation is offered as the reason why we were not prepared to take active part in the war in which our soldiers are just beginning to make themselves felt. We will not, therefore, be able to offer the excuse that we are not a peaceful nation if the return of peace also finds us unprepared.

During the year past one and a half million men in the United States have been more or less gradually withdrawn from peace pursuits for active warfare, and a much greater number for industries directly connected therewith; and probably an equal number will be withdrawn during the coming year. It will perhaps be no exaggeration to say that ten million of our citizens, and possibly twenty, will be directly engaged in war work. On the day that peace is signed this ten or twenty million will instantly be released from war work to return to peaceful industry. Three-fourths of this number are already here and those in France (in Germany then, we hope and believe) will be returned as rapidly as ships can bring them. What is to be done with them?

The industries that formerly employed them have adjusted themselves to get along without them, and readjustment for taking them back can be only gradual. It will be up to the government to provide for them. And this provision must be in the form of work—any other kind of provision would be disastrous. And in this the federal government will need the aid of all state, county and city governments. Every city should be ready to provide immediate work for at least double the number of men that left it for the war zone, since, even

allowing for those that will never return, those engaged at home in war industries will swell the total to this number.

The following is quoted from the annual report of Charles H. Wacker, chairman of the Chicago Plan Commission:

Although I am unalterably opposed to undertaking anything which could interfere with the successful prosecution of the war, I am certain that it is a great mistake not to prepare for peace in time of war. Other countries are doing this, but as yet we are not. Unless we begin at once, we will be just as unprepared for peace, industrially and commercially, as we were unprepared for war.

We must "keep the home fires burning." When the war is over, thousands upon thousands of our boys will return to their homes to be confronted with lack of employment, possibly depleted in health, and requiring the work, nurture and protection our preparedness program then can afford them. And when the war is over, factories that are now making munitions, building ships, and working to the fullest capacity to carry on the different branches of war industry, will have largely ceased this work, adding to the ranks of the then unemployed, particularly during the period of rehabilitation and readjustment.

Is it not plainly the duty of the city to be ready at that time to carry on great construction projects, requiring the use of money, labor and material, preparation for which must be made in advance? We should prepare so that we can give workmen employment and not make them objects of charity.

After the war more than ever will there be needed public improvements of a character that will give the people more light, air, recreation, health, and freedom from congestion—improvements that will tend to their general health, happiness and well-being, in order that they may remain a strong, a virile, and a capable people—and, remember, please, that the people's demand for these humanitarian benefits will be stronger and more insistent after the war than ever before in the history of our country—and it must be met.

There, it seems to us, is the answer. There is none too much time if the cities should all begin at once to plan work for these men. It should not be wasteful work—construction that serves no useful purpose or a pattering at pretended work that is merely a cloak for charity. There is no need for this. We believe that any city can find ways to employ five per cent of its population in needed improvements—improvements that have been delayed or abandoned because of the war. The essential need is to have plans for these all prepared beforehand so that work on carrying them out can be started on a week's notice.

Let the city planners get to work at once—not the aesthetic but the practical, engineering kind—and let councils adopt definite projects for future improvements. Then let these be developed to the point where telegrams can be sent to manufacturers on an hour's notice ordering steel, iron pipe, vitrified pipe, cement, stone, brick, etc., so that they may at once employ a part of the men in producing these materials; to the point where laborers and trucks (there should be thousands of war trucks available) can be set at work immediately at grading streets, clearing sites, digging trenches and other preliminary work; while the returning engineers can be employed in the supervision of the work.

Let every city official try to imagine in all its practical details the problem that will confront his city the day after its boys return home and get busy preparing to meet it.

MUNICIPAL BONDS OVERSUBSCRIBED.

It is encouraging to those cities that are expecting to issue bonds this summer that the five and a half million dollar issue of Philadelphia was over-subscribed five times by thirty-seven bidders a few days ago. These were $4\frac{1}{2}$ per cent. thirty-year bonds and brought a premium of 2.177 per cent.

THAWING SERVICES AND HYDRANTS AT WINDSOR.

By H. R. TURNER.*

The fire district of Windsor, Connecticut, like most other cities in the northern part of the country, had more or less trouble last winter with the freezing of fire hydrants and house connections, although no mains were frozen. The method employed in thawing service pipes is one that seems to be used quite extensively in Connecticut. The apparatus required consists of a coil of about 100 feet of $\frac{1}{8}$ -inch copper tubing, a hand force pump, a pail, and a gasoline furnace. In thawing a frozen house service, the service is disconnected at the stop and waste valve in the cellar and one end of the copper tubing is inserted into the service pipe at this point. The other end of the tube is connected to the outlet of the force pump. The suction line of the force pump is inserted in the pail which is filled with water, the water being heated by a gasoline heater on which the pail is placed. When the water is sufficiently hot, it is pumped by means of the force pump through the copper tubing and thaws the ice ahead of the tube, the hot water and that from the melting ice flowing back through the service pipe into the cellar. The tube is pushed forward into the service pipe as rapidly as the melting ice will allow.

This method of thawing requires the services of one skilled man and two laborers as helpers. The longest service thawed by our district last winter was 109 feet of $\frac{3}{4}$ -inch pipe. The rate of thawing was from twenty to twenty-five feet per hour of $\frac{3}{4}$ -inch pipe. The largest service thawed was a $1\frac{1}{2}$ -inch pipe.

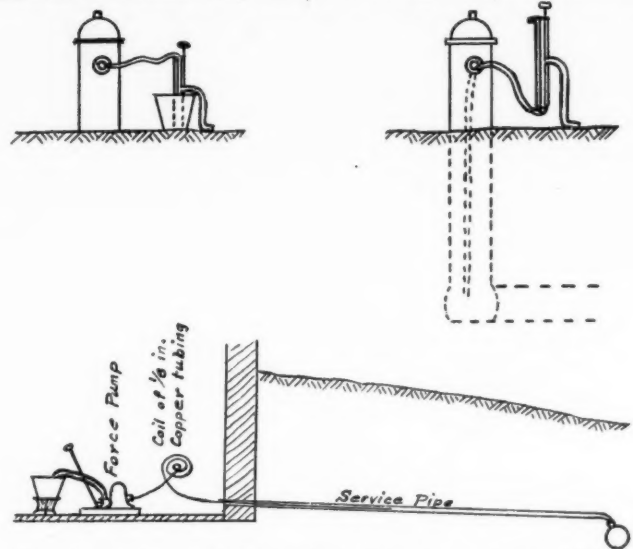
For thawing fire hydrants, the apparatus used was arranged by the writer, who has found it very convenient for use when the number of hydrants with frozen barrels is small. The apparatus consists of an ordinary bucket spray pump (such as is commonly used in spraying small fruit trees), 8 feet of $\frac{1}{2}$ -inch garden hose, and one female brass hose connection. The screen in the bottom of the pump barrel is removed and the female hose connection soldered on in place of it, so that the $\frac{1}{2}$ -inch hose can be attached to serve as a suction line.

In thawing a hydrant, the pump, without the hose, is set in a pail of boiling hot water, the hose is attached to the discharged end of the spray pump, and the hot water is forced through it into the barrel of the hydrant. Two pails of boiling water is the largest amount that I have found it necessary to use in thawing a hydrant barrel that was completely frozen for about five feet in depth.

After the barrel has been thawed out, the hydrant is thoroughly flushed, and if the drain valve is not working

properly the eight-foot length of hose is attached to the base of the pump and the end is inserted in the hydrant barrel, and the barrel is pumped out.

This method of thawing and pumping out hydrant barrels was found very effective during the past winter, as



METHODS OF THAWING HYDRANTS AND SERVICES AT WINDSOR, CONN.

it required only a small number of tools and the service of two men for about one-half hour on each frozen hydrant. It has proved a very simple method of thawing fire hydrants where the frost has not penetrated deep enough to freeze the connection between the hydrant and the main. In cases where hydrant barrels are found full of water, this same pump attachment is used for draining the barrels.

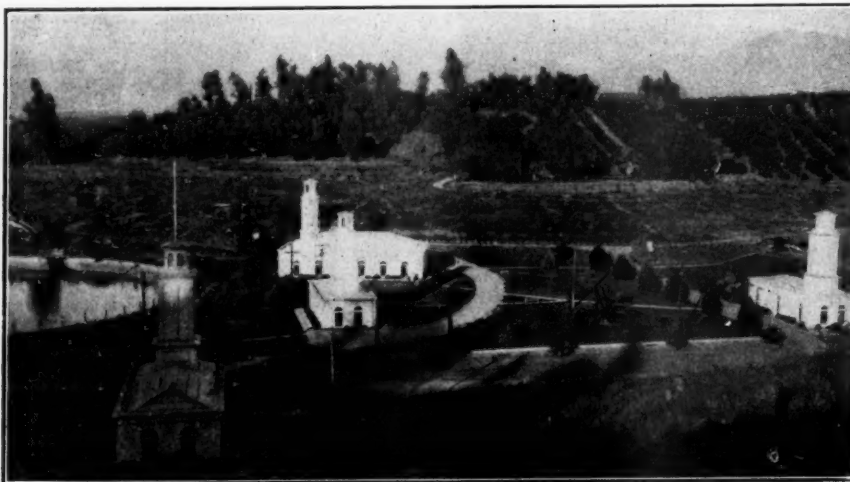
ASPHALT ON RESTRICTED IMPORTS LIST.

The War Trade Board has placed asphalt on the restricted imports list, imports for 1918 being limited to a total quantity of 30,000 tons from Venezuela and 32,000 from the Island of Trinidad. All outstanding licenses for the importation of asphalt are revoked as to shipments made after June 15th, 1918. Allocation of the amounts permitted to be imported, regulation of the price and other details will be arranged after conference with the War Industries Board.

PUMPING STATION PARK AT REDLANDS.

The pumping station of the Redlands, Cal., water works, is located in a plot of 22 acres of land, and this has been

given a simple parking treatment, consisting of driveway, walks, lawns and shrubbery, as shown in the accompanying illustration. These grounds are open to the public for picnics or play grounds and are maintained in the same way as the other city parks, city engineer George S. Hinckley informs us. The reservoir shown in the photograph is used for irrigation purposes only, so that the possibility of pollution by visitors is not a matter of concern. The water used for domestic use is pumped to a reservoir on an adjacent hill from the side of which this photograph was taken. The pumping plant has a capacity of 13,000,000 gallons per day.



REDLANDS PUMPING PLANT AND IRRIGATION RESERVOIR.

*Superintendent of Windsor Fire District.

The WEEK'S NEWS

Indiana's State Highway Department in Difficulties—New Government Committee on Highways—Passaic Valley Sewer Contract Litigation—Washington's Venereal Disease Campaign—Power Conservation in California—Eliminating Vice in Toledo—Philadelphia Sells \$5,500,000 Bonds at Good Premium—Roanoke Has Double Election—New York's Proposed New Pension Plan—Edmont on, Canada, Raises Fares on Municipal Car Lines.

ROADS AND PAVEMENTS

State Highway Department Disintegrated.

Indianapolis, Ind.—L. H. Wright, chairman of the state highway commission, has announced that the commission has released from its employ its entire force, consisting of approximately forty engineers and assistants and other workers, pending the decision of the supreme court in the case before it on appeal from a Hamilton county court, which declares the highway commission law invalid. The action has been taken, according to Wright, because the commission did not wish to incur any expense in connection with work under the highway law, until it has been definitely established that the law is valid. In case the supreme court should hold it invalid, expense incurred by the commission could not be met legally. In the case of William S. Moore, state highway engineer, whom the commission had employed at a salary of \$4,500 a year, Wright said the commission had retained him in his position, but had ceased the payment of his salary. Wright does not know whether Moore will continue to hold his position with the commission, pending the decision of the court, or whether he will sever his connections with the state body. The latter condition is anticipated. Pending the decision Wright and a bookkeeper are handling what business is possible. Federal matters, pertaining to road supervision in the state and some inspection work are being done, Wright said.

Vote Bond Issues for Lincoln Highway Construction.

La Porte, Ind.—Acting in conjunction with the other communities in the state through which the Lincoln Highway passes, the Lake county council has voted an appropriation of \$300,000 for the permanent improvement of the local section of the trans-continental route. Twelve miles of road will be built, extending from Schererville to the county line. The road will be either of concrete, brick or asphalt. It is anticipated that a state appropriation of \$75,000 will be added to the funds provided by the county, making possible the expenditure of a total of \$375,000. The bonds will be placed on sale at the earliest possible date, and actual construction started at the first available opportunity.

New Federal Committee to Encourage Highways.

Washington, D. C.—As a result of a two-day conference between federal officials and representatives from the state councils of defense of twenty-three states it is expected that the attitude of the government towards highway construction as a national need will soon be more clearly and favorably defined. A government policy of highway development—even to replace the short-line steam railroads—may be worked out and truck manufacture and necessary highway construction encouraged. Under the auspices of the Highway Transport Committees of the Council of National Defense, of which Roy D. Chapin is chairman, delegates from Alabama, Connecticut, Colorado, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New York, New Jersey, North Carolina, Ohio, Pennsylvania, Rhode Island, Tennessee, Texas, Virginia, Wisconsin, West Virginia and the District of Columbia discussed immediate action on good roads, state-wide return load bureaus and rural motor-truck express routes. R. C.

Wright, assistant traffic director of the railroad administration, declared that Director-General McAdoo is most heartily in favor of highway transport development. Mr. Wright expressed the opinion that motor transportation over the highways will eventually do away with the short line railroads, which, he said, have always been a serious burden to steam transportation.

D. C. Fenner of New York City, David Harper and J. F. Winchester of New Jersey and state highway commissioner Bennett, of Connecticut, described the work of the return loads bureaus of their respective localities. F. C. Ertzman, secretary, Highways Transport Committee of Illinois, and W. E. Hull pointed out the economic waste of the poor roads in their state and urged government assistance. Rural motor truck routes were urged by F. C. Marquis, member of the Highways Transport Committee, having charge of this phase of the committee's work; P. R. Wilson, food administrator of Washington, and J. N. Barnsley, who operates such a line. The United States Department of Labor was represented by C. T. Clayton, who said that the inauguration of adequate rural truck lines would be equivalent to placing 100,000 efficient farmers at actual work on the farms, this labor being wasted in long trips to cities and other transportation difficulties. The National Automobile Chamber of Commerce has been promoting the rural express idea, as described by S. A. Miles. George H. Pride, of the committee, pointed out that these two phases of transportation were dependent on good roads. Delegates from a number of states complained that money set aside for road improvement cannot be used for that purpose because of disapproval by the capital issues committee. A federal road policy was made the subject of a resolution unanimously passed and presented to the Council of National Defense. Captain Vandervelde of the motor transport section of the French army described how the good roads had saved France at the 1914 battle of the Marne. He declared that without 2,000 trucks, mostly of American make, which operated continually day and night carrying ammunition, food and other supplies to the troops, Verdun would be in the hands of the Germans to-day. He declared that all systems of transportation except the trucks broke down. Mr. Chapin brought out the fact that Great Britain has recently appointed a road transport board, to which has been turned over every sort of vehicle in England, Scotland and Wales, excepting farm wagons.

H. G. Shirley, secretary of the Highways Industries Association, and formerly state highway commissioner of Maryland, urged that motor truck development be not allowed to outrun highway development. Lieut.-Col. W. D. Uhler, speaking for Quartermaster General George W. Goethals, declared that the motor trucks have helped immeasurably in speeding up war work, particularly in the utilization of them in hauling emergency materials. He stated that 6,000 trucks have been moved from Detroit and other Western cities to the seaboard, each carrying a full load of freight. He cited the transfer of the entire office equipment of the Emergency Fleet Corporation from Washington to Philadelphia as an instance of the emergency service the trucks are rendering. He said that launching of merchant ships has been materially speeded by delivery of needed parts of engines and other machinery by truck, and that regular army truck lines have been established to carry goods, asked in emergency orders of General Pershing, from factory to ocean transport.

A few days after this conference a new government highways committee was formed. It consists of representatives of the War Industries Board, the Fuel Administration, the United States Railroad Administration, the Highways Transport Committee, the Department of Agriculture and the Motor Transport Service of the Army. The main functions of the new committee will be to cooperate with the state authorities in the development of highways, to coordinate the various agencies interested and to clear up the complexities of the situation. At the head of the new committee will be Logan Waller Page, director of the Office of Public Roads of the Department of Agriculture. The Highways Transport Committee will be represented by Roy D. Chapin and the army by Lieut.-Col. W. D. Uhler. It is planned to functionalize the work of the committee, the Fuel Administration deciding upon asphalt questions; the War Industries Board having charge of cement, stone, etc.; the rail administration determining matters of transportation; the Highways Transport Committee passing on the commercial and the Motor Transport Service on the military necessity of specific highways.

SEWERAGE AND SANITATION

Settle Passaic Valley Sewer Contract Suit.

Newark, N. J.—Settlement of the long standing controversy between the Passaic Valley Sewerage Commission and the O'Rourke Engineering Construction Company of New York has been effected, the latter having agreed to accept \$72,167.97, with interest at 6 per cent. from June 16, 1916, as payment in full and to drop a suit for \$1,164,336.94 that has been pending in the United States district court since March of last year. The interest will amount to about \$8,000. Of the \$72,167.97 the commission admits that it owes the company \$22,167.97, and the remaining \$50,000 had been held as a guaranty that it would perform its contractual obligation. In the action against the commission the company, which had the contract for the sewer in what is known as Section 2, reaching from a point under the Hudson Boulevard in Bayonne, out under New York Bay to Robbins Reef Light, claimed serious losses and heavy expenditures as the result of alleged misrepresentation by representatives of the commission concerning the nature of the ground through which the out-fall tunnel was to be driven, as well as losses of profits on the portion of the work given up with the beginning of the controversy. In the complaint served upon the commission the company said in part: "The chief engineer, with knowledge and consent of the commissioners, did falsely, fraudulently and deceitfully make statements for the purpose of deceiving and defrauding the plaintiff and inducing the plaintiff to bid on and make said contract at a price for which the service could not be performed without loss of money to the plaintiff." In the detailed claim against the commission most of the items cited were for extra work, said to have been necessitated by the ground conditions, and for the additional equipment the company claimed it was forced to get to meet the situation. The contract was awarded March 3, 1914, and it was virtually abandoned on March 1, 1917. The contract took in a stretch of 15,000 feet, and of this about 5,000 feet was completed, the company received \$426,968. The remainder, the amount of the settlement, was retained by the commission. The commission claimed there was no misrepresentation in the preparation of the specifications upon which the company bid for the contract, and the amount of the settlement was the same as a previous offer to the company.

City Wants Water Company to Pay for Sewer.

Jersey City, N. J.—Under authority of a rule allowed by Chancellor Walker at Trenton application in behalf of Jersey City will be made before vice chancellor Stevens at Newark, for permission to review the proceedings involving the settlement of the dispute between Jersey City and the East Jersey Water Company over the purchase

of the Jersey City water plant under the Flynn contracts of 1899. The purpose of the present proceedings is to compel the East Jersey Water Company, rather than Jersey City, to pay for the construction of the \$1,000,000 intercepting sewer to be built in the Rockaway Valley to protect Jersey City's water supply from pollution by the towns of Dover, Boonton and Rockaway. The application made to the Chancellor by Albert C. Wall, as special council for Jersey City, adds another chapter to the long series of litigations involving the Flynn contracts for building Jersey City's water supply plant at an approximate cost of \$7,500,000. Following years of litigation the city, under a decree of the court, paid over the bulk of the contract price and took title to the water plant. The decree of the court, however, set aside portions of the contract price to be held in abeyance, pending certain eventualities relating to the contract. One of the contentions made by Jersey City was that the water company had not provided sewers and sewage disposal works to protect the purity of the water, as required by the contract. As an alternative to the construction of such sewers and disposal plant the water company proposed to install a disinfecting apparatus, using a bleach or chloride of lime as a means of making the water safe. It was represented that this plant could be installed for approximately \$20,000 and that it would preserve the purity of the water as effectively as the million-dollar expenditure proposed for a trunk sewer. In view of the experimental nature of the chloride process, whose adequacy at that time had not been tested, the court decided to permit the installation and to hold in abeyance so much of the contract price as would be necessary for the installation of the trunk sewer. In presenting his case to Chancellor Walker, Wall said that during the seven years Jersey City has operated its water plant there has been cumulative evidence that the disinfecting plant is not an adequate substitute for the sewers and disposal works contemplated by the contract.

Legalities Stop State-Wide Disease Campaign.

Olympia, Wash.—Plans for handling Washington's state-wide campaign against venereal diseases through the establishment of large general internment camps, must be temporarily abandoned. Not until the legislature changes the laws and provides enabling legislation can groups of several counties cooperate in support of one big receiving hospital. Each county within the state in the meantime must deal with the situation as an independent unit, and care for its own disease sufferers. The ruling comes from attorney general W. V. Tanner, who was asked to pass upon the question of whether one county could send its disease sufferers into another county for treatment.

Spokane, Wash.—The attorney general's ruling does not affect Spokane's individual program for handling social disease cases, which has resulted in the reorganization of the health department and the employment of more doctors and nurses, according to city commissioner Charles Fleming, but it will halt immediate plans for securing the use of old Fort Spokane as a big general internment camp for disease victims from all over eastern Washington. "We shall go ahead with our preparations for taking care of social disease cases for the city and county of Spokane, right here in the city," said Mr. Fleming. "These will be cared for at the city's contagion hospital and in connection with the emergency hospital, recently brought under the jurisdiction of the health department. I have no doubt, however, that the next legislature, meeting in January, will make provisions under which the state will handle these cases in big general hospitals or internment camps, serving several counties, instead of requiring each county to handle its own social problem. Should that be done, I anticipate that our committee will go ahead with efforts to obtain as an internment camp for the eastern part of Washington and possibly the old quarantine station at Diamond Head, out of Seattle, for the western part of the state." Reorganization of the city health department agreed upon by the city council some

time ago as a means of expediting the handling of the social disease quarantine urged by the war department has become effective. Dr. H. Ransom of Clarkston, Wash., has arrived here to assume charge of the campaign and of the emergency hospital, which under the reorganization, passed from the jurisdiction of the department of public safety into the control of the health department.

STREET LIGHTING AND POWER

Commission Suggests Lower Profits for Utilities.

Lewiston, Ida.—In giving the Pacific Power & Light company, of Lewiston, permission to advance its rates temporarily the public utilities commission, in its order, has adopted the policy of allowing public service corporations to increase charges during the war because of the necessity many are put to meet operating expenses. The Lewiston company wanted to increase its rates materially. The utilities commission after an investigation agreed to a slight advance in prices charged for gas with the understanding that a new ruling would be forthcoming after the war. In the opinion of the commissioners many of the public service corporations which made a fair return off of money invested before the war now find it difficult to meet expenses. When passing on the Lewiston company's application the commission said: "There will no doubt be some increase in expenses on account of increased costs of labor and materials, but the commission does not feel that it must authorize such increase in rates as will permit the company to declare the same dividends as were earned in the past. We are living in unusual times. All are called upon to forego many pre-war privileges and luxuries, and the commission believes that the stockholders of the company should bear a portion of the increased burdens incident to the war."

Commission Allows Gas Rate Increase.

Bridgeton, N. J.—Permission to raise the rate for gas from \$1 per thousand feet to a net rate of \$1.12½ has been granted the Bridgeton Gas Light Company by the state board of public utility commissioners. The application for permission to increase the rate was made by the gas company on December 17, 1917. The application was opposed by a hastily organized citizens' protective league, and there was also a committee appointed from city council to look after the interests of the taxpayers in the matter. The board finds that a war surcharge of 15 cents per thousand cubic feet may be added to the existing rates, subject to a discount of 2½ cents per thousand cubic feet on bills for gas sold through regular meters if the bills are paid within ten days after presentation. These rates may be effective for sales made from May 1st, 1918. Acceptance by the company of the increases allowed will be taken as a stipulation that abrogation or modification of the war surcharge may be made as and if conditions as indicated by operating results warrant. Beginning at the effective date of the new schedule of rates, the company is to render reports monthly to the board showing the operating revenues, operating deductions, excluding general amortization, non-operating income, income deductions and balance available for amortization, dividends and surplus and amount appropriated for general amortization for each succeeding calendar month, with comparison with the figures for the corresponding month of 1917; and the board will retain jurisdiction of the emergency of war surcharges as approved, for the purpose of modifying or abrogating them as and if the conditions change.

California Pledges Power Conservation.

Sacramento, Cal.—Users of electric power, particularly those who use the electricity for agricultural undertakings, have been requested by the federal fuel administration to conserve, and where possible to use the current during night hours only. Pledge cards, similar to those used by the food administration, have been sent out by Albert E. Schwabacher, federal fuel administrator for California, with a request that they be signed and returned. The cards in question request considerable information as to the pumping equipment of consumers, acres irrigated, source of water supply, crops raised, etc. It is explained

by the circulars accompanying the pledge cards that in California the principal fuel is oil, and the need of conservation of oil is daily growing more acute. The fact that the hydro-electric source is not now adequate is touched upon, with the explanation that oil is used to generate the current in connection with steam plants. Power companies are now utilizing all facilities during the day hours, but there is an excess of power available between six in the evening and eight in the morning. Industrial plants that are obliged to operate during daylight hours are now using more power than is at present available. Those who sign the cards are pledged:

1. To operate plants only between the hours of 6 p. m. and 8 a. m. insofar as it is possible to do so, avoiding operation between 8 a. m. and 6 p. m.
2. To keep plants in efficient condition, thus avoiding waste of power. The greatest loss generally occurs as a result of
 - (a) Improper pump speed for the head pumped against.
 - (b) Leakage of air through loose stuffing boxes.
 - (c) Loose and slipping belts.
 - (d) Improper adjustment of pumps or other equipment.
3. To open transformer switches when plants are not in operation, thus saving power ordinarily wasted as transformer losses.
4. To avoid unnecessary operation of plants.
5. To see that water is not wasted by careless or inefficient distribution.
6. To make every other reasonable effort to conserve power.
7. To co-operate with the power company in this patriotic campaign by calling on its nearest representative for information and advice.

Court Approves Bond Issues for Light Plant.

Loveland, Colo.—Possibility of facing suits for the recovery from their personal bank accounts of about \$12,000 of the city money of Loveland, used under their direction in the construction of a tunnel for the Loveland municipal lighting project, passed for a group of Loveland men who were members of the city council in 1914 when the supreme court handed down a decision in the first of the suits of the city of Loveland vs. the Western Light & Power company. The judgment of the lower court in effect put the stamp of its approval on the first of the bond issues authorized by Loveland voters for the purpose of constructing their proposed light plant. The case in which the supreme court rendered its decision was started several years ago, when the power company sought to restrain work on the Loveland project on the ground that the election at which a \$79,000 bond issue had been approved was invalid. The issue was attacked on the ground that the amount was \$53,000 in excess of the bonding powers of the city. Meanwhile the city council went ahead and spent \$12,000 of the general funds of the city on work on the project, and there was some talk among the citizens of Loveland who joined the light company in bringing suit, that if the case went their way in the supreme court they would attempt to make the councilmen who voted for the expenditure of this money, pay the bills. The supreme court, however, has held that the first election and the acts of the council under it were valid. The bonds originally voted have never been issued, for the next state legislature adopted a law which enlarged the bonding ability of Loveland and subsequently an issue for \$83,000 was approved. At the present time no work is progressing on the project because of war conditions.

FIRE AND POLICE

Firemen Decide Not to Strike.

Spokane, Wash.—Resolutions asserting the loyalty of their organization to the government and to the city and its people, and giving that as a reason for reconsidering their contemplated action, were adopted at a meeting of the city firemen, at which it was decided not to present the written resignations of 97 of their number because of a refusal of immediate wage increases. This, it is stated, will end the concerted movement started several weeks ago in an endeavor to force the city commissioners to wage increases before next January by threatening a walkout of many of the most experienced firemen. The firemen's demands for an increase of \$15 per month were turned down by the city council, which at the same time practically promised increases to the firemen and many other city employes when the 1919 city budget is made up. At the

same time, Mayor Fassett expressed the hope that the firemen would demonstrate their loyalty by remaining in their positions in the meantime, because of the difficulty their resignations would present to the city in filling their places with inexperienced men. Plans were being worked out by the city officials to prevent a walkout of any firemen planning on returning to work by making two days' absence from duty without leave the equivalent of a resignation, and it was planned to let down the civil service bars to permit the city to employ men in the open labor market for the fire department.

Difficult Store Blaze.

Pittsburgh, Pa.—Fire caused by two explosions of undetermined origin destroyed three floors of the building occupied by a 5 to 50 cent store in the heart of the business district. A seventy-six-year-old night watchman was seriously injured by the first explosion and afterwards died in the hospital. Two firemen were overcome while fighting the flames, which for a time threatened to spread to the rest of the block. Three alarms were turned in, all of the downtown fire apparatus responding. The loss is estimated at \$150,000. For a time the fire got beyond control of the men and a number of adjacent stores were threatened.

Business District Swept By Fire.

Caribou, Me.—Almost the entire business section of this town was destroyed by fire, several business blocks and dwellings being burned, causing damage estimated at \$500,000. The fire department was delayed in fighting the flames because of a broken water main. Help had to be summoned from Presque Isle, Washington, Fort Fairfield and Houlton. The apparatus from the latter town arrived on a special train, covering the 61 miles in one hour and 21 minutes. The blaze, starting in the kitchen of a restaurant, spread rapidly. The burned buildings were located on three streets. The cause is unknown. The buildings burned included ten business blocks and two residences. None of the schools or other public buildings situated in that section were destroyed.

Vice Elimination in Toledo.

Toledo, O.—The city's "tenderloin" officially went out of existence recently by mayor Schreiber's order. This was a war-time health measure, requested by military authorities for conservation of man-power. Approximately 1,300 women of the underworld were compelled to leave the city or abandon their method of living. In a formal statement mayor Schreiber explained that the abolition of the tenderloin is not a spasmodic attempt at reform, but is meant to be a permanent re-establishment of the order of things, necessitated by war-time conditions. Safety director Wall instructed police chief Herbert to carry out the clean-up order, and the chief pledged himself to do it thoroughly. The order followed several weeks of government investigation. The order meant the elimination of 38 registered resorts, housing 245 white and 60 colored inmates. Besides these, it was estimated by the police department, there were 700 white and 300 colored immoral women scattered through questionable districts of the city, all known to the police. Health commissioner Dr. C. W. Waggoner states that pending the securing of a municipal hospital for the treatment of the cases that need to be hospitalized the patients are applying for treatment at the city dispensary. Here they are examined, and samples of their discharges and samples of blood are taken for analysis by the city's serologist, Dr. S. S. Hindman. If they are found to have a venereal disease and they need hospital care they are sent out to the county hospital for several weeks of treatment, usually six weeks. This work has been going on quietly for a year or more. The health commissioner expects the number of patients to increase rapidly as soon as the women find out that they will not be permitted to continue their illicit business in other parts of the city, nor in suburban towns. When that time comes he predicts that the city will be swamped with victims of venereal disease who want to be rid of it. To take care of them other facilities will have to be provided. It was to anticipate

this coming demand that the commissioner proposed the remodeling of the university science building for use as a contagious disease hospital. The terms on which the building had been purchased made it impossible to be used permanently as a hospital, and it was thought inadvisable to spend the money necessary for remodeling and equipping it when it could only be used for a short time. At present there are several other plans under consideration. One considered most favorably contemplates the lease of a residence formerly used for immoral purposes, and located in the heart of the district. This could be put into condition, says the commissioner, to accommodate forty or fifty patients, the maximum number expected to need hospital care at any one time. The larger number of the patients will be treated outside the hospital. Council has authorized the welfare director to enter into a lease for this purpose. Because there is no method by which persons afflicted with the disease can be compelled to take the treatment provided only those can be cared for who come voluntarily or who are arrested by the police for continuing in the business. Efforts will be made to find positions in the industries for those who do take the treatment and who are cured. Already the co-operation of one large concern has been secured, and others will follow. In order that the women can enter the industries without being branded as social outcasts the bureau of industrial hygiene of the health division is canvassing the factories to get them to require a physical examination of all employees. The health commissioner states that the greater number of venereal infections are not due directly to these women. A universal examination of all the employees will disclose this fact, he says, and will help to prevent the redeemed women of the former vice district from being singled out for derision.

The most effective state law for curbing vice in cities was passed by the last legislature in March, 1917. It declares "places in which lewdness, assignation or prostitution exists to be nuisances," and provides for their abatement. Under its provisions "the attorney-general of the state, the prosecuting attorney of the county, or any person who is a citizen of the county, may bring an action in equity to abate such nuisance and to perpetually enjoin the person or persons maintaining the same from further maintenance thereof." Action can be brought in the common pleas court, and the procedure is described in detail in the act. If the injunction is granted by the court and the place found to be a nuisance of this kind an order of abatement must be entered as a part of the judgment in the case, directing the removal and sale of all the personal property found there. A tax of \$300 is to be imposed against the person maintaining the nuisance.

Aid Summoned From Other Towns.

Brownsville, Pa.—The whole of the downtown business district was threatened by a fire which broke out in the basement of 5 and 10-cent store in the Grand Opera House building, a three-story frame structure. The building was destroyed and the loss on it and other buildings is expected to reach \$200,000. The Brownsville fire companies were unable to cope with the fire and aid was summoned from Connellsville, Uniontown and other towns. Within a space of ten minutes the fire had spread to a furniture store and drygoods store, which occupied a five-story frame structure to the north, and to a barber shop and a grocery store, which occupied a two-story frame building to the south. A number of firemen were overcome by smoke and had to be carried from the burning buildings.

GOVERNMENT AND FINANCE

City Gets Good Premium on Bond Issue.

Philadelphia, Pa.—A total premium of more than \$119,000 was given the city in the high offer for the \$5,500,000 bond issue, for which bids were opened recently. The offer was for the entire issue and was submitted jointly by Reilly, Brock & Co. and the First National Bank, of New York, who bid \$102,177. Mayor Smith Announced the award

of the issue to this combination. Three other bids for the entire issue were submitted, each offering a premium. They were: William A. Read & Co., \$102,047; Drexel & Co., Brown Brothers & Co., Harris, Forbes & Co. and the National City Company, of New York, in combination, \$101,418, and Montgomery & Co. and the Equitable Trust Company, of New York, \$100.89. Altogether thirty-seven bids were received, the loan being between four and five times oversubscribed. Most of the bids were for less than \$100,000 and three for less than \$500. Twenty-one of the bids named their price at par. One was below par and one was thrown out. The issue of thirty-year bonds bears an interest of $4\frac{1}{2}$ per cent, to which the rate was recently raised by councils. This is the highest rate of interest ever attached to this city's municipal bonds, the previous usual rate having been 4 per cent. Part of the issue, \$2,500,000, is for the payment of mandamuses arising from the acquisition of property for public improvements. The remaining \$3,000,000 is a part of the general loan of \$42,450,800 authorized June, 1916. This is the fifth loan during the administration of mayor Smith. The five total \$40,549,000. The last previous loan was for \$7,275,700, and was sold by the city treasurer over the counter at par.

Elect Under Old and New Systems at Same Time.

Roanoke, Va.—A double election was held here for five councilmen under the new form of councilmanic-manager government now being contested in the courts, and also for councilmen and aldermen to fill vacancies under the old bicameral system of government in case the new form is declared unconstitutional. In the contest for councilmen under the new form, there were 23 candidates and the contest was heated, but the five men selected as a Citizens' ticket came out with large leads.

Proposes New Comprehensive Pension Plan.

New York, N. Y.—Joseph Haag, secretary of the mayor's commission on pensions, has submitted to the board of estimate a report dealing with the pension problem and proposing to establish a sound retirement plan for all employees entering the city service. The plan is similar to that adopted for teachers. It provides for participation in the cost of the benefits on about equal terms between the city and its employees. It also protects employees at the expense of the city against all accidents and disabilities arising as the result of the performance of duty. Mayor Hylan is said to favor the plan. Mr. Haag declares that unless legislation proposed in his report is adopted "the city will shortly be struggling under a budget item of approximately \$18,000,000 a year for pensions alone, even though the thousands of clerks, laborers and mechanics in the city service are not adequately covered by pension benefits." Provision has been made in the bill that any present employee who prefers the advantage offered by the new system may elect to enter it and to discontinue his connection with the old pension fund. Some features of the proposed plan follow: Retirement allowances averaging one-half pay are provided on the attainment of certain ages, varying from age 55 to 62, according to the employee's occupation; but if they remain in service they receive proportionally increased allowances. Allowances are provided to employees disabled after ten years of service. These allowances vary from 25 per cent. to approximately half pay, depending upon the length of service. If disability is the result of the performance of duty a pension is allowable, regardless of length of service. Three-quarters pay is allowed as a minimum in such cases. Employees dying in service are to be covered by insurance benefits provided by the city, and their families are to receive all of the employee's contributions with interest. If the employee's death is the result of performance of duty his widow and children are covered by half-pay pensions, and in addition his contributions are repaid to them with interest. The majority of entrants will contribute about 4 per cent. of their salaries. If they resign or if they are dismissed they are to receive back their contributions with interest.

TRAFFIC AND TRANSPORTATION

City Car Line Raises Fares.

Edmonton, Alta.—The Radial Railway, operated by the city, has instituted new rates, the cash fare being increased to 7 cents till 11 p. m. After that hour the rate is 10 cents. The revised rates fixed by the council are as follows: Tickets purchased off the cars at ticket-selling stations, five for 25 cents; tickets bought on the cars, four for 25 cents. No workmen's tickets are now issued. Children under six years of age are carried free. Tickets for children more than six and under fifteen years of age, and high school pupils carrying certificates, ten for 25 cents, or one-half fare. Children carried after 11 p. m. pay half fare. Between 5 and 6:30 p. m. 5 cents is charged on baby carriages and large parcels. No change has been made regarding transfers.

Commission Has No Power to Require Amortization.

New York, N. Y.—According to a decision by the state court of appeals, the public service commission for the First District has no authority to require an electric railway to reserve a definite percentage of its revenues for maintenance and depreciation. This is the result of a legal fight started following such an order in February, 1912, in connection with the reorganization of the old Metropolitan Street Railway in New York City. The successor company, the New York Railways, was required, before paying any interest on its income bonds or dividends on its stock, to set aside each month 20 per cent of its gross operating revenue for maintenance and depreciation and, if this was not expended during the month, to credit the unexpected amount to an account called "accrued amortization of capital." The company objected to the order on the grounds that the commission was without power to make it; that the required reservation was not always needed in full for the purposes designated and that the directors were the proper persons to determine the depreciation rate and amount of reserve. Last January the appellate division of the supreme court in certiorari proceedings affirmed the order, with the finding that the regulatory law had conferred full power upon the commission to regulate the methods of public service corporations. This decision of the lower court, however, has now been reversed by the highest court in the state, the court of appeals. The opinion of this court states that the commission bases its authority to make the order upon section 52 of the public service commission act, which provides for the establishment of a system of accounts. In regard to this the court, with the unanimous approval of the six judges sitting on the case, says:

Section 52 was plainly intended to make the method of accounting by these corporations uniform so that the accounts could be readily comprehended by those required to examine the same. By establishing a system of accounts the corporations were required to show under particular heads what they had done. It was not to regulate the management of their finances, but to show what the management was.

The other sections of the act clearly do not in express terms authorize the commission to require the creation of a reserve fund to renew the plant when the same shall be worn out or shall become obsolete. It is not pretended by anyone that they do.

The power of the Public Service Commission is extensive, and the act creating the commission should be construed in the same spirit in which it was enacted. Still, when a particular power is exercised by the commission or is claimed for it, that power should have its basis in the language of the statute or should be necessarily implied therefrom. The assertion of authority under review here is outside and beyond the statute.

The decision in *Quinby vs. Public Service Commission* (223 N. Y. 244) is controlling here, and requires us to hold that the Public Service Commission had no authority to make the order requiring the company to reserve 20 per cent of its gross operating revenue for maintenance and depreciation and for the creation of the amortization of capital account.

As of June 30, 1917, the account for "accrued amortization of capital" amounted to \$3,127,258, equivalent to more than 10 per cent on the outstanding adjustment income 5 per cent bonds. Although interest on these bonds is non-cumulative, the bondholders assert that the fund should be distributed among them. No interest payment on these securities has been made since 1916.

NEWS OF THE SOCIETIES

CALENDAR OF MEETINGS.

June 21, 22.—NEW JERSEY ASSOCIATION OF COUNTY ENGINEERS. Annual meeting, Mt. Holly and Toms River, N. J. Secretary, T. J. Wasser, Jersey City, N. J.

June 24-26.—AMERICAN CONCRETE INSTITUTE. Annual meeting, Atlantic City, N. J.

June 25-28.—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J. Secretary-treasurer, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

June 26-28.—SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION. Annual meeting, Northwestern University, Evanston, Ill.

June 26-28.—AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Annual convention, Atlantic City, N. J. Secretary, F. L. Hutchinson, 33 West 39th St., New York City.

July 10-12.—OHIO ELECTRIC LIGHT ASSOCIATION. Twenty-fourth annual convention, Breakers Hotel, Cedar Point, O. Secretary, D. L. Gaskill, Greenville, O.

Aug. 27-29.—LEAGUE OF CITIES OF THIRD CLASS IN PENNSYLVANIA. Nineteenth annual meeting, Erie, Pa. Secretary, Fred H. Gates, city clerk, Wilkes-Barre, Pa.

Oct. 2-4.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Annual meeting, Buffalo, N. Y. Secretary, Charles Carroll Brown, 304 E. Walnut St., Bloomington, Ill.

American Concrete Institute.

The following program has been announced for the annual convention of the American Concrete Institute as postponed from the original date in February at Chicago, when traffic conditions made the postponement advisable. The expected attendance of many members of the Concrete Institute at the annual meeting of the American Society for Testing Materials at Atlantic City, June 25-28, and the portions of the concrete field occupied by this society and the Concrete Institute in common suggested June 27-29 and Atlantic City for the convention of the latter. Through the courteous co-operation of the officers of the American Society for Testing Materials, through Dr. Edgar Marburg, secretary, the headquarters of both the American Society for Testing Materials and the Concrete Institute will be at the Hotel Traymore, and a joint session will be held on Thursday, June 27, 8 p. m. On account of the limited time available for the full program no provision has been made for recess for recreation.

Thursday, June 27, 8 p. m.—Joint Session with American Society for Testing Materials. Report of A. S. T. M. Committee C-1, "On Cement," R. S. Greenman, chairman; Report of A. S. T. M. Committee C-2, "On Reinforced Concrete," F. E. Turneaure, chairman; Report of A. C. I. Committee on "Treatment of Concrete Surfaces," J. C. Pearson, chairman; "Tests of Stucco," J. C. Pearson (A. C. I. paper); "Tests of Concrete Columns," W. A. Hull (A. C. I. paper); "Effect of Age on the Strength of Concrete," D. A. Abrams (A. S. T. M. paper); "Proportioning the Materials of Mortars and Con-

cretes by Surface Areas of Aggregates," L. N. Edwards (A. S. T. M. paper).

Friday, 10 a. m.—Concrete Properties and Products. Report of the Sub-Committee on "Research," W. A. Slater, chairman; "Apparatus for Testing Under Uniform Load," H. H. Schofield; "Plasticity and Temperature Deformations in Concrete," S. C. Hollister; Report of Committee on "Building Blocks," R. F. Havlik, chairman; "Concrete in Art Work," R. F. Havlik; "Problems in Concrete Surfaces," J. J. Earley; "Reinforced Concrete for Railway Purposes," Charles Gilman.

Friday, 3 p. m.—Design and Tests. Report of Committee on "Far Rockaway Fire," Richard L. Humphrey, chairman; Report of Committee on "Reinforced Concrete and Building Laws," E. J. Moore, chairman; "Moment Coefficients in Flat-Slab Design," W. K. Hatt; "Tests of Western Newspaper Building," A. N. Talbot and H. F. Gonnerman; "Theory and Test of Flat Slab with Ring Reinforcement," Edward Smulski; Report of Committee on "Concrete Chimneys," L. R. Cobb, chairman; "Design of Concrete Chimneys," J. G. Mingle.

Friday, 8 p. m.—Concrete Houses. Report of Committee on "Industrial Concrete Housing," L. H. Allen, chairman; "Industrial Housing and Labor Turnover," L. H. Allen; "Advantages

and Disadvantages," J. E. Conzelman; "Examples," A. B. Whipple; "Methods of Construction of Concrete Houses," K. H. Talbot; "Architectural Design of Concrete Houses," Emile G. Perrot; "Interior Design of Concrete Houses," M. D. Morrill.

Saturday, 10 a. m.—Concrete Roads and Pavements. Report of Committee on "Roads and Pavements"; "Concrete Roadways for the Industrial Plant," G. S. Eaton; Report of Committee on "Sidewalks and Floors"; "Effect of Time of Mixing on the Strength and Wearing Qualities of Concrete," D. A. Abrams; "Distortions and Vertical Changes of Concrete Pavement Slabs Due to Subgrade Movements," J. W. Lowell; "Surface Requirements for Concrete Roads," A. H. Hunter; "Progress in Concrete Pavement Design and Construction at Winnetka, Illinois," F. A. Windes; "Concrete Road Construction in Vermilion County, Illinois," P. C. McArdle; Report of Committee on "Concrete Sewers."

Saturday, 3 p. m.—Structures and Buildings. "Reinforced Concrete Columns Under Eccentric Load," L. J. Mensch; "Cold Storage Buildings of Concrete," G. H. Brazer; "Core Construction," A. H. Bromley, Jr.; "Relation of Costs to Design of Reinforced Concrete Buildings," C. W. Mayers; "Construction of C. & N. W. Railway Grain Elevator," C. F. Huffman; "Construction of Reinforced Concrete Building for American Can Co.," N. M. Loney; Report of Committee on "High-

(Continued on page 520.)

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Preston County, Kingwood, W. Va., is to build a brick ROAD. The engineer for the improvement is E. Smith.

Extensions to its WATER WORKS are to be made by Clay Center, Neb. Plans and specifications were prepared by Charles F. Sturtevant.

Ontario, Canada, in making improvements at the William Head, B. C., QUARANTINE STATION, has the engineering services of the firm of Chipman & Power.

STREET IMPROVEMENTS are to be made by Washburn, Wis. The consulting engineering firm of Reichardt & Pierce has prepared plans and specifications for the work.

WATERWORKS and SANITARY SEWERAGE SYSTEM are to be built by Fountain Inn, S. C. The consulting engineer for the improvements is J. N. Ambler.

Ogdensburg, N. Y., is to improve a CANAL by widening, constructing retaining walls and drainage facilities. Plans for the improvements were prepared by the Hydraulic Construction Company.

Carroll County, Vaiden, Miss., is to construct thirty miles of ROADS. The consulting engineer for the improvement is W. C. Stowell.

STREET IMPROVEMENTS are to be made by Cooper, Tex. The consulting engineer for the work is Henry Exall Elrod.

Elmhurst, Ill., is to build a SEWAGE DISPOSAL PLANT. Plans and specifications for the works were prepared by the consulting engineer, Edwin Hancock.

Leamington, Ont., is to construct a RESERVOIR for its water supply. Plans and specifications for the work were prepared by the consulting engineer, J. J. Newman.

Pottawattamie County, Council Bluffs, Ia., is STRAIGHTENING the channel of a RIVER. The engineers for the project are the firm of Price & McCormack.

The Adrian Water Co., Adrian, Mich., is to extend its WATER SUPPLY SYSTEM, including adding of new pumping machinery. The consulting engineer for the improvement is A. H. Smith.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

HIGH DRUM "NON-TIP" PAVER.

"Boss" Lincoln Highway Mixer of Improved Design.

The new "Lincoln Highway" pavers are the latest developments in the "Boss" line of concrete mixers. They are especially designed for a wide range of work and emphasis is placed on greater lightness and greater strength. Economy of operation, in costs, labor and time, is the important feature of the new paver.

One valuable quality of the construction is the "non-tip" safeguard. The danger of tipping is eliminated by the unusually wide track and wide tires. The pavers are all built with high drums, the bottom of the discharge spoon being six feet from the ground.

The capacity of the paver is 14 ft. unmixed or 10 ft. mixed concrete, and is designed to lay 87 street yards per hour, based on one minute mixing time. It has the Boss patented high speed mixing and discharging action, doing the work with fewer revolutions than are necessary in other types.

The chute is sectional and pivoted. It may be raised or lowered by a powerful winch. The three gates allow dumping concrete right up to the paver. This chute is particularly eco-

nomical, as it saves unnecessary moving. The high drum gives steep pitch to the chute, which is 14 ft. long and swings from curb to curb.

The automatic loading hopper is of the two-man charging type, with an equalizing cable arrangement. It stops automatically and throws a brake at unloading position. It has a steep pitch and big, non-choking throat. It is built heavily reinforced. It has a special measuring pressure water tank, the valve of which can be set for uniform batches. A special non-leak three-way valve is also used. The tank is tested for 125 pounds pressure and is electric welded. It is under one-lever control.

Eight horse-power "Novo" or "Ideal" gasoline or "Novo" kerosene engines are furnished—with high tension magnetos—frost and dust proof. Steam or electric power may be had if preferred. The clutches are of the powerful toggle type, easily adjusted. The massive drum gear is chilled semi-steel, all gears being over-sized. The traction chains are of 30,000 lb. strain union steel; the transmission chain being case-hardened steel, roller type.

The machine has two-way traction—machine-cut traction or reversing gears; geared low for slow speed and big surplus power. The machine is built almost entirely of steel. The frame is heavy 7-inch steel, hot riveted and well-braced. The front axle is 3-

inch steel; the rear is 5x5 and the wheels are high and heavy.

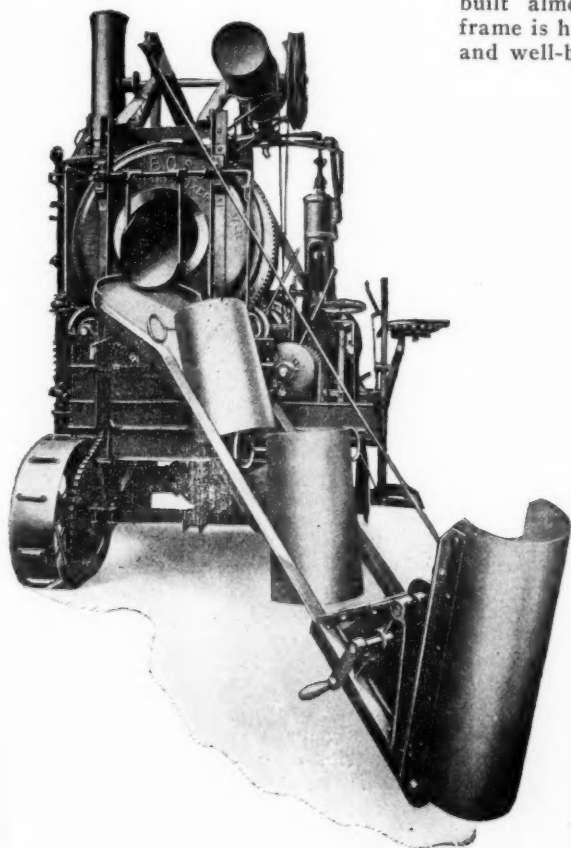
Another important feature is the one-man control. All levers are banked within reach of the operator. A "built-in" hoist may be used to pull straight edge or leveling board, thus saving one man's time back of paver.

The Lincoln highway paver, two views of which are shown in the accompanying illustrations, is made by the American Cement Machine Co., Keokuk, Ia., makers of the well-known line of mixers, grouters, hoists, pumps, backfillers, material elevators and concrete carts.

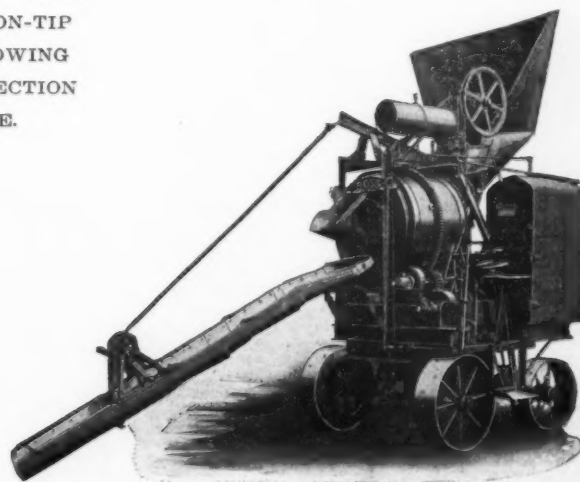
INDUSTRIAL NEWS

Government Takes Over Steel and Iron Supply.

Following recent conferences, the War Industries Board and the American Iron and Steel Institute have effected an agreement by which Director of Steel Supply J. L. Replogle practically assumes control over the distribution of iron and steel. The supply is to be distributed to plants manufacturing war materials first; then to producers of so-called "essential" products named in the current preference list of the priorities committee, and then, if there remains a surplus, to other consumers officially approved. The agreement says that study of the situation has disclosed the necessity for: "(1) A strict conservation of the available supply of iron and steel products, on the one hand, and (2) the expansion of existing sources and development of new sources of supply of iron and steel products, on the other hand." No pig iron or steel manufactured products will be shipped or delivered, except as follows: (1) By pri-



"BOSS"
LINCOLN HIGHWAY
PAVER, NON-TIP
TYPE, SHOWING
THREE-SECTION
CHUTE.



ority certificates issued by the Priorities Division of the War Industries Board; or (2) after priority certificates shall have been issued for or filled, then producers of pig iron and of steel manufactured products may utilize such raw materials and manufacturing capacity, if any, as they may have available, to fill orders of their customers not covered by priority certificates, provided such orders are embraced within the schedule of purpose entitled to preference treatment as determined by the Priorities Board as follows:

Ships.—Including destroyers and submarine chasers.

Aircraft.

Munitions, military and naval supplies and operations.—Building construction for Government needs. Equipment for same.

Fuel.—Domestic consumption. Manufacturing necessities named herein.

Foodstuffs for human consumption and plants handling same.

Feeding stuffs for domestic fowls and animals, and plants handling same.

Food and collateral industries.—All tools, utensils, implements, machinery, and equipment required for production, harvesting and distribution, milling, preparing, canning and refining foods and feeds such as seeds of foods and feeds, binder twine, etc.

Products of collateral industries, such as fertilizer, fertilizer ingredients, insecticides and fungicides.

Containers for foods and feeds, collateral products.

Materials and equipment for preservation of foods and feeds, such as ammonia and other refrigeration supplies, including ice.

Clothing.—For civilian population.

Railroad.—Or other necessary transportation equipment, including water transportation.

Public utilities.—Serving war industries, army, navy, and civilian population.

Including all necessary raw materials, partially manufactured parts, and supplies for completion of products.

Whenever the Priorities Board shall have promulgated and certified for observance to the producers of pig iron and steel manufactured products, a revised preference list, no surplus material or capacity after filling or providing for all orders covered by priority certificates shall be used to fill non-priority orders save such as are placed by industries or plants embraced within such preference list.

Each producer of pig iron and of steel manufactured products shall at the end of each week, ending with midnight Saturday thereof, prepare and forward to the Director of Steel Supply of the War Industries Board a detailed statement of all shipments made during such week not covered by priority certificates.

Should any producer of pig iron or of steel manufactured products have any surplus war material or manufacturing capacity after filling (a) all orders covered by priority certificates and (b) all orders embraced within the schedule of purposes entitled to preference treatment or placed by industries or plants embraced within the revised preference list, after it shall have been promulgated and certified by the Priorities Board, then in such event such surplus materials or capacity may be disposed of by such producer or manufacturer to other customers subject to the approval in writing of the director of steel supply first had and obtained.

The director of steel supply and a committee appointed by the American Iron and Steel Institute shall jointly make a careful study of the present and prospective iron and steel requirements of each and every department and agency of the Government of the United States and of its Allies, and the capacity of the iron-producing and steel-manufacturing plants of the United States to meet such requirements and present to this board as early as practicable (1) a report of their findings, together with (2) recommendations of measures, if any, which should be taken to stimulate and increase the production of iron and of iron and steel products in order to meet the direct and indirect war requirements and the demands of indus-

tries of exceptional or national importance.

In view of the estimate that the Government will require at least 85 per cent of the total output of the industry for strictly war purposes, it is doubtful whether there will be a surplus after all allocations have been made to plants included in the preference list; but the officials of the board are inclined to the opinion that while there may not always be a margin there will be from time to time considerable quantities of iron and steel for general consumption and the board pledges itself to adopt every possible method to reduce to a minimum the hardship suffered by the non-essential industries. Steps will be taken immediately to increase the output of the iron and steel industry in the most practicable manner. It is probable, in the opinion of the Director of Steel Supply and other members of the board, that occasions will arise when it will be impossible to supply even the plants included in the preference list with 100 per cent of their needs, but in seeking to do so pig iron and all forms of semi-finished steel will be transferred from the plant of one consumer to that of another wherever necessary, due regard being given to the avoidance of hardship. In dealing with all the industries of the country, including the automobile manufacturers, the Government will constantly keep in mind the competitive situation both at present and as it may exist at the end of the war. Allowances of material for non-essential purposes will be made with the principle of equity constantly in view and no single manufacturer in any trade will be allowed advantages which his competitors do not enjoy.

Cast Iron Pipe.—Pipe manufacturers are still uncertain as to the effect of the resolutions adopted by the War Industries Board in regard to the distribution of iron and steel products. Cast-iron pipe is not put on a preferential list, as had been hoped, but manufacturers believe that they will be allowed to receive pig iron for use in making pipe and fittings for Government work, which is at present a large part of their business. The new Government prices announced recently are now being quoted. Quotations: Chicago: 4-inch, \$63.35; 6-inch and larger, \$60.35; Class A \$1 extra. Birmingham: 4-inch, \$58; 6-inch and larger, \$55; Class A \$1 extra. New York: 4-inch, \$64.35; 6-inch and larger, \$61.35; Class A \$1 extra.

Hydroelectric Scheme in India.—The government of Madras has accepted the proposal of the chief engineer of a combined water supply and hydroelectric scheme from the Sriveni River for supplying Coimbatore and Podanur, South India, with water and electric power, the cost of which amounts to approximately \$1,329,377. Persons interested should address the chief engineer, Public Works Department, Government of Madras, Madras, India.

NEWS OF THE SOCIETIES

(Continued on page 518.)

way and Culverts"; "Flat-Slab Railway Bridges," A. B. Cohen.

Saturday, 8 p. m.—Reinforced Concrete Barges and Ships. Report of Committee on "Nomenclature," W. A. Slater, chairman; Report of Committee on "Concrete Barges and Ships," H. C. Turner, chairman; "Principles of Design of Concrete Ships," R. J. Wig and S. C. Hollister; "Illustrated Paper on Concrete Ships," J. E. Freeman; "Concrete Ships," Archibald G. Monks; "Concrete Barges," O. F. Lackey. Several other papers on concrete ships are expected, but not yet authorized to be announced. A film will be shown of the launching of the 4,500-ton ship "Faith" at San Francisco.

Annual Conference of Health Officers.

The sixteenth annual conference of State and Territorial Health Authorities with the United States Public Health Service was held in Washington, D. C., June 3 and 4.

Following opening remarks by the surgeon general, the roll call of delegates, and the appointment of committees the following committee presented their reports: "Matters Related to War," Dr. H. M. Biggs; "Morbidity Returns," Dr. A. J. Chesley; "Sanitation of Public Conveyances," Dr. Oscar Dowling; "Rural Sanitation," Dr. W. S. Rankin; "Trachoma," Dr. A. W. Freeman; "Increasing Efficiency of Conferences," Dr. W. C. Woodward.

The following subjects were discussed as new business: Sanitation of extra cantonment areas, especially as related to the work of state and local health authorities. The venereal diseases: Their control, with reference to the relation of the United States Public Health Service to state and cities in handling this problem. Better control of communicable diseases and disease carriers, especially in the case of cerebrospinal meningitis and typhoid fever. Use of records of drafted men for public health purposes. Relation to public health of industrial hygiene and sanitation, especially in war industries. Care of health of tuberculous soldiers and relation to the public health, especially after their return to civil life. Trachoma and its bearing on the public health of the military forces. Hookworm disease: The importance of its prevalence and control among the military forces. Effects on the public health of the forthcoming shortage in the medical profession. Better morbidity reports: How to secure them. (a) Fees to physicians; (b) appointments of collaborating epidemiologists in every state and assistant collaborating epidemiologists in every county; (c) issuance of weekly bulletins containing detailed summaries of reports from 100 representative cities; (d) creation of registration area. Railroad water supplies. Pellagra.